RUBY-7720VG2A

Micro-ATX Mainboard

User's Manual

Version 1.0

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Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your RUBY-7720VG2A system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2: Hardware Configuration. Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide variously of useful tips to quickly get RUBY-7720VG2A running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

RUBY-7720VG2A is a cost-effective Micro-ATX embedded board which takes the advantages of Intel® Pentium® M/Celeron® M processor and Intel® 915GME/ICH6-M chipset for the applications those need low power consumption or Fanless solution. With various display interfaces, multiple legacy I/O and dual Ethernet, RUBY-7720VG2A is capable to provide the most essential functions for the applications such as Lottery, Gaming, POS, Medical and Digital Signage.

RUBY-7720VG2A can run with Intel Socket 479 Pentium® M / Celeron® M processors and support two 240-pin DIMM sockets up to 2GB DDR2 Memory. The onboard SATA and IDE controllers can support 2 SATA devices with data transfer rates up to 150MB/s and 1 IDE devices with Ultra ATA 33/66/100 synchronous mode feature. To expand storage using, it also include 1 Type I/II compact flash socket. The onboard Super I/O chip supports four serial ports; one is RS232/422/485 selectable and three are in RS232 data format. Besides, it can also support dual display function by VGA, LVDS interfaces.

RUBY-7720VG2A can support one PCI Express X 16 slot, one PCI Express X 1 slot and two PCI slots. It provides extra One Parallel and one FDD connectors. The onboard Flash ROM is used to make the BIOS update easier. One 20-pin standard connector is designed to support ATX power function. All of these features make RUBY-7720VG2A series excellent in stand-alone applications.

1.2 Check List

The RUBY-7720VG2A package should cover the following basic items

- ✓ One RUBY-7720VG2A Mini ITX Board
- ✓ One SATA cable
- ✓ One IDE cable
- ✓ One I/O Shield
- ✓ One Installation Resources CD-Title

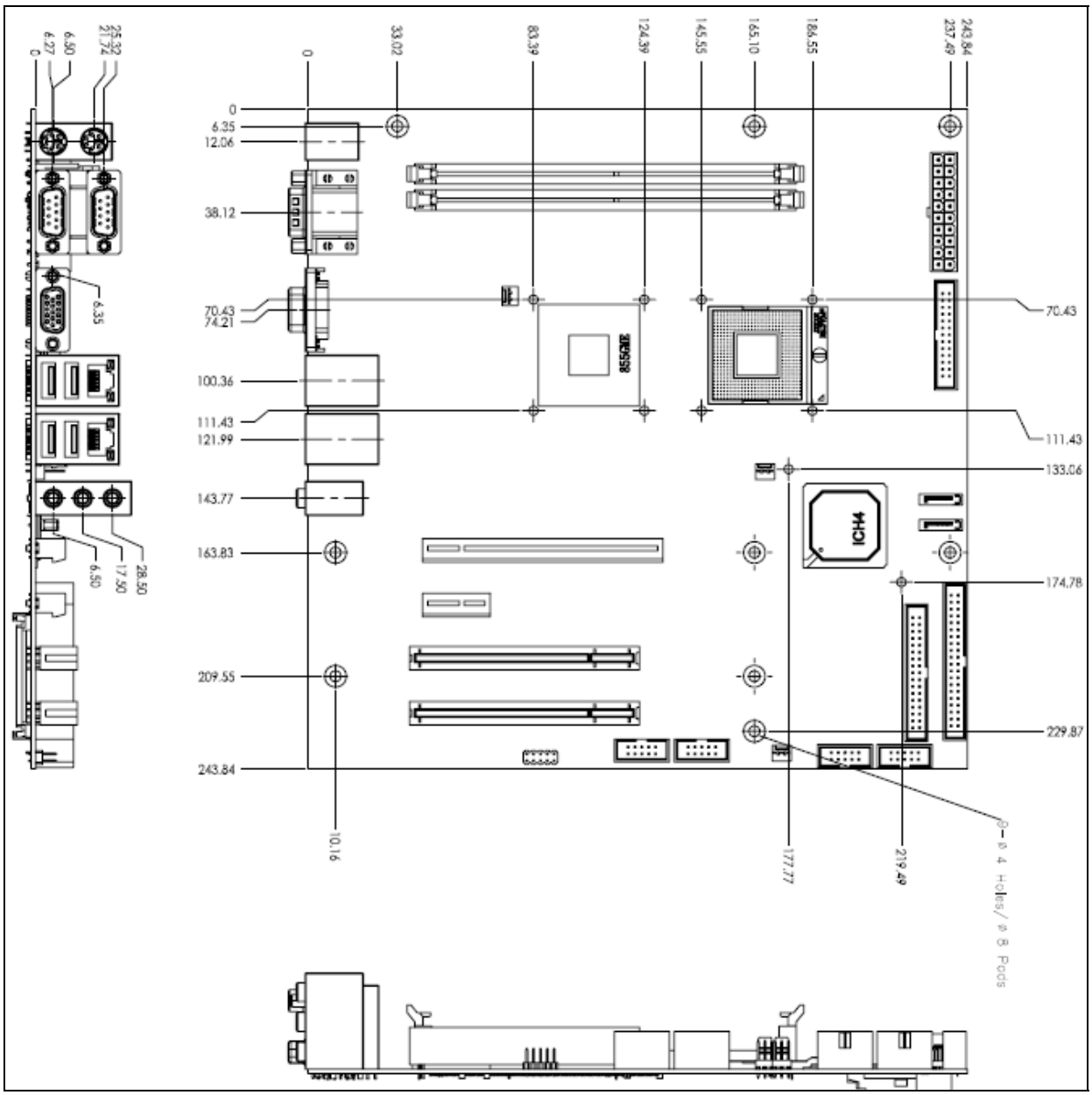
If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main processor**
  - Support Intel Pentium® M / Celeron® M processor
  - FSB: 533/400 MHz
- **BIOS**
  Award BIOS
- **Main Memory**
  - Support dual-channel & signal channel DDR memory interface
  - Up to 2GB DDR2 533/400 SDRAM on two 240pin DIMM sockets
- **Chipset**
  INTEL 915GME and ICH6-M
- **Expansion Interface**
  - One PCI Express X 16 slot
  - One PCI Express X 1 slot
  - Two 32-bit PCI expansion slots
- **IDE Interface**
  Support only one IDE device (Master) with Ultra DMA/33/66/100
- **SSD**
  One Compact Flash® Type I/II socket, support UDMA
- **SATA Interface**
  Two SATA connectors, data transfer rates up to 150MB/s
- **Serial Ports**
  Support four serial ports, (RS-232selectable x 3, RS-232/422/485 selectable x 1)
- **IR Interface**
  IrDA 1.0 compatible
- **Parallel Port**
  Support one parallel port
- **USB Interface**
  Support eight USB (Universal Serial Bus) ports (four at rear I/O; four ports internal)
- **PS/2 Mouse and Keyboard Interface**
  Support dual 6-pin mini-DIN connector at rear I/O panel for PS/2 keyboard/mouse
- **Audio Interface**
  Connector and header of Line-in/Line-out/MIC for external and internal usage
- **Real-Time Clock/Calendar (RTC)**
  - Build-in ICH6-M
  - Y2K compliant

- **Watchdog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - Generate system reset
- **On-board VGA**
  GMCH integrated Intel Graphics Media Accelerator 900 (Intel GMA 900)
- **On-board Ethernet LAN**
  Two Gigabit Ethernet (10/100/1000 M bits/sec) LAN port
- **High Driving GPIO**
  Programmable 8-bit Digital I/O interface
- **System Monitoring Feature**
  Monitor CPU temperature, system temperature and major power sources, etc
- **Outline Dimension (L X W):**
  243.8mm (9.6") X 243.8mm (9.6")
- **Power Requirements:**
  Typical: 5V@4.0A; 12V@6.5A; 3.3V@3A
- **Operating Temperature:**
  0°C ~ 55°C
- **Storage Temperature:**
  -20°C ~ 80°C
- **Relative Humidity:**
  5% ~ 90%, non-condensing

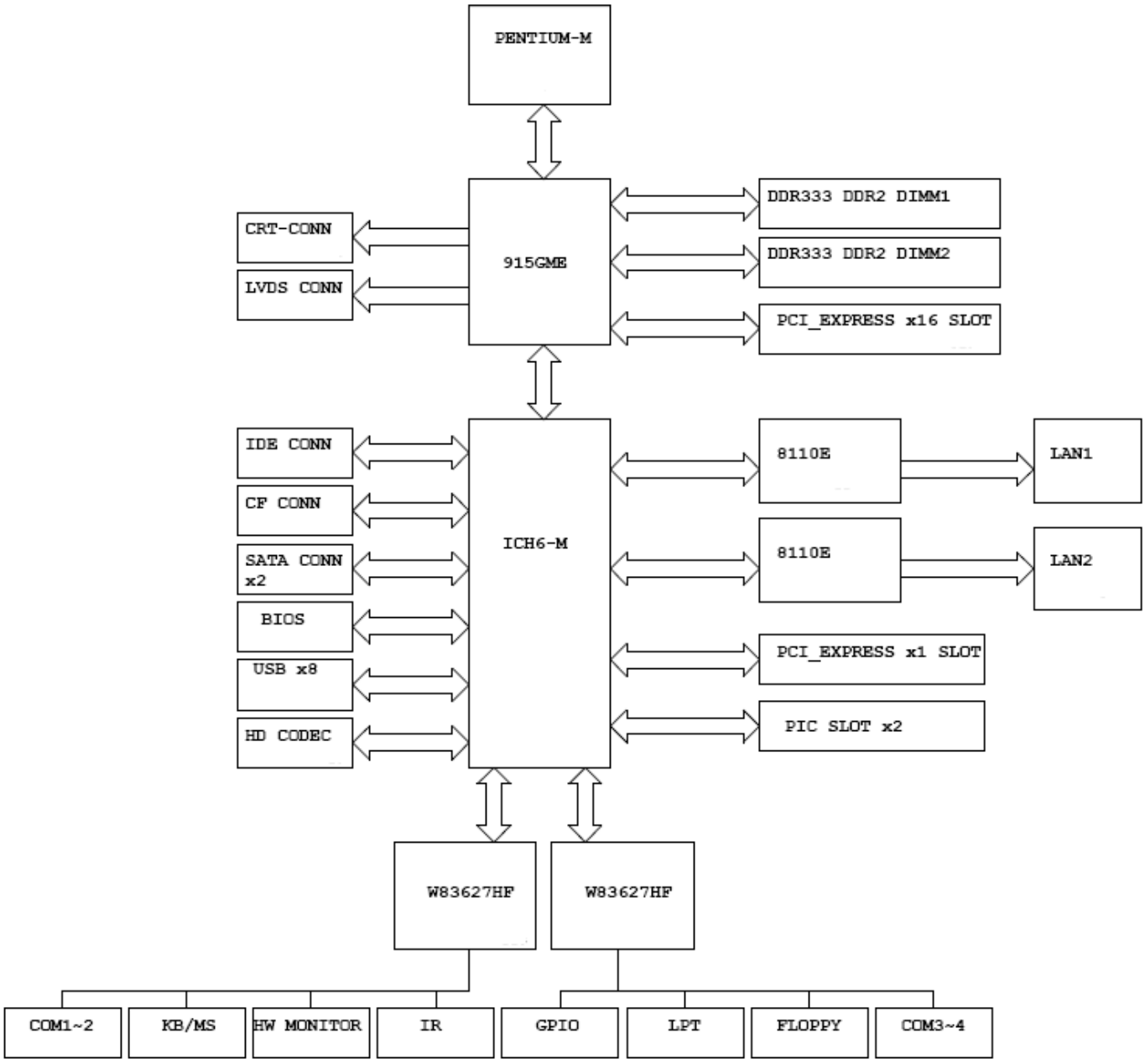
1.3.1 Mechanical Drawing



RUBY-7720VG2A Mechanical Drawing

1.4 System Architecture

All of details operating relations are shown in RUBY-7720VG2A System Block Diagram.



RUBY-7720VG2A System Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on RUBY-7720/7721 are in the proper position. The default settings are indicated with a star sign (★).

2.1 Jumper Setting

In the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 2-1 for the Jumper allocations.

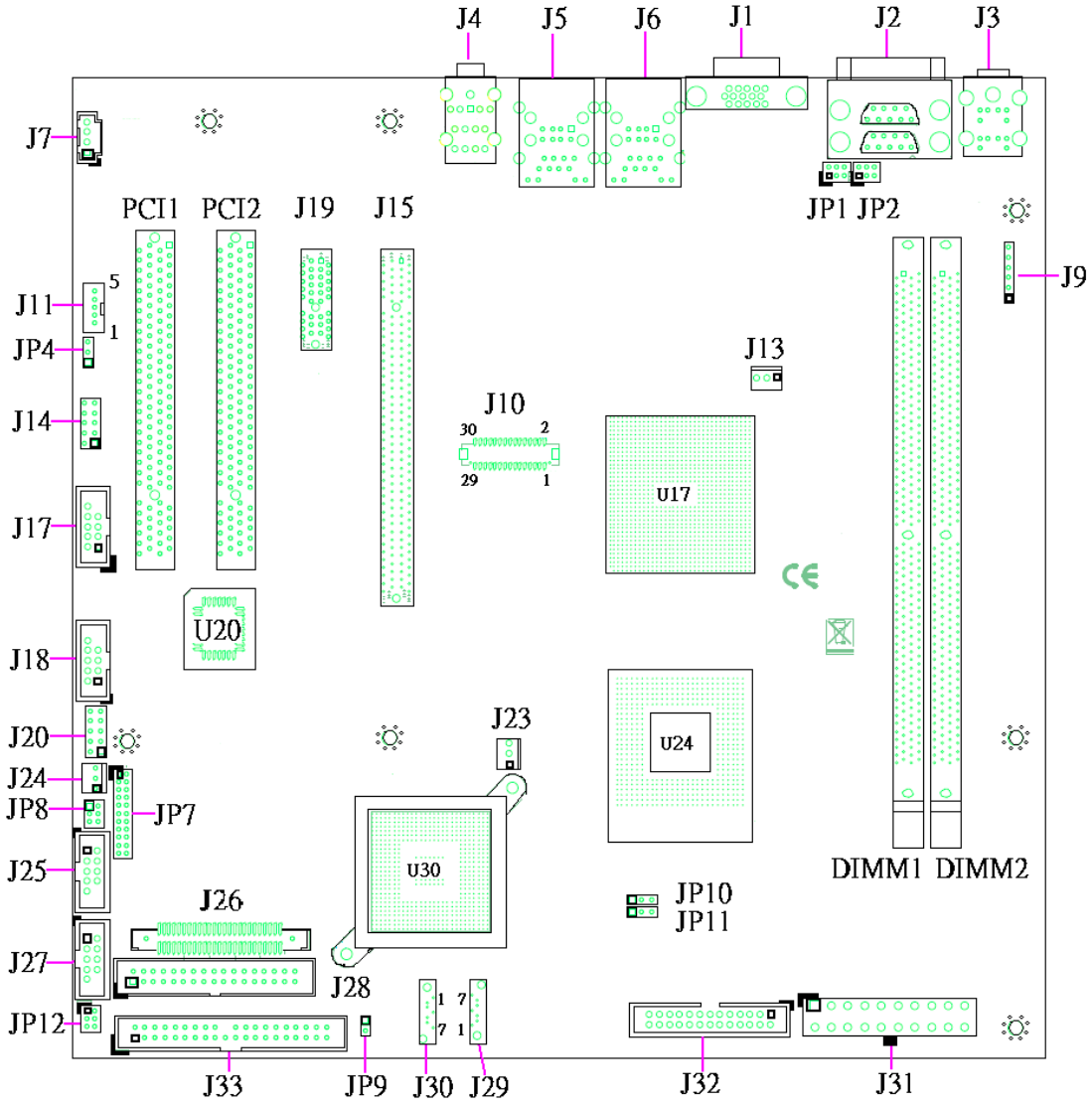


Figure 2-1 RUBY-7720 Jumper and Connector Locations (TOP)

JP1 : COM1 RI Function Setup

JP1	Signal Description
1-2 Short	+5V Output
3-4 Short	RI Function ★
5-6 Short	+12V Output

JP2 : COM2 RI Function Setup

JP2	Signal Description
1-2 Short	+5V Output
3-4 Short	RI Function ★
5-6 Short	+12V Output

JP3 : LCD Panel Voltage Setup

JP3	Signal Description
1-2 Short	+3.3V TFT LCD ★
2-3 Short	+5V TFT LCD

JP4 : LCD Backlight enable Voltage Setup

JP4	Signal Description
1-2 Short	+3.3V TFT LCD ★
2-3 Short	+5V TFT LCD

JP6 : CMOS Setup

JP6	Signal Description
1-2 Short	Clear CMOS Setup
2-3 Short	Normal (Keep CMOS Setup) ★

JP7 : COM3 RS232/RS422/RS485 Function Select

COM Function	Jumper setting
RS-232	5-6, 9-11, 10-12, 15-17, 16-18 ★
RS-422	3-4, 7-9, 8-10, 13-15, 14-16, 21-22
RS-485	1-2, 7-9, 8-10, 19-20

JP8 : COM3 RI Function Setup

JP8	Signal Description
1-2 Short	+5V Output
3-4 Short	RI Function ★
5-6 Short	+12V Output

JP9 : CF Card Mater/Slave Setup

JP9	Signal Description
1-2 Short	Master
1-2 Open	Slave ★

JP10 : CPU FSB Setup (this setting is just for RUBY-7720)

JP10	Signal Description
1-2 Short	FSB 400MHz ★
2-3 Short	FSB 533MHz

JP11 : CPU Type Setup (this setting is just for RUBY-7720)

JP11	Signal Description
1-2 Short	BANIAS ★
2-3 Short	DOTHAN

JP12 : COM4 RI Function Setup

JP12	Signal Description
1-2 Short	+5V Output
3-4 Short	RI Function ★
5-6 Short	+12V Output

2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors

Connector Function List

Connector	Description	Remark
J1	VGA Connector (D-SUB 15 Pin female)	
J2	COM1 (RS-232) & COM2 (RS-232) (D-SUB9 *2)	
J3	PS/2 Keyboard/Mouse Connector	
J4	Line-OUT/Line-IN/Microphone connector	
J5	LAN2 RJ-45 & USB (2~3) Connector	
J6	LAN1 RJ-45 & USB (0~1) Connector	
J7	Audio CD-IN Connector	
J9	IR Interface (1*6 Pin Header)	
J10	LCD LVDS Connector (2*15 Pin Hirose)	
J11	Inverter Power Connector (1*5 Pin wafer)	
J12	PS/2 Keyboard/Mouse Connector	
J13	System Fan1 Connector (1*3 Pin Wafer)	
J14	System Panel Connectors (2*5 Pin Header)	
J15	PCI Express*16 Slot	
J17	USB (4~5) Connector (2*5-1 Pin Header)	
J18	USB (6~7) Connector (2*5-1 Pin Header)	
J19	PCI Express*1 Slot	
J20	GPIO Connector (2*5 Pin Header)	
J21	GPIO Connector (2*1 Pin Header)	
J22	GPIO Connector (2*1 Pin Header)	
J23	CPU Fan Connector (1*3 Pin Wafer)	
J24	System Fan2 Connector (1*3 Pin Wafer)	
J25	COM4 (RS-232) (2*5-1 Pin Header)	
J26	Compact Flash Connector (Vertical type)	
J27	COM3 (RS-232) (2*5-1 Pin Header)	
J28	Floppy Disk Driver Connector	
J29	SATA2 Connector	
J30	SATA1 Connector	
J31	ATX Power In Connector (2*10 Pin)	
J32	Print Port Connector (2*13 Pin Box Header)	
J33	Primary IDE Interface Connector (2*20-1 Pin Box Header)	
J34	Compact Flash Connector (Horizontal type)	

Pin Assignments of Connectors

J1 : VGA Connector (D-SUB 15 Pin female)

J2 : COM1 (RS-232) & COM2 (RS-232) (D-SUB9 *2)

J3 : PS/2 Keyboard/Mouse Connector

J4 : Line-OUT/Line-IN/Microphone connector

J5 : LAN2 RJ-45 & USB (2~3) Connector

J6 : LAN1 RJ-45 & USB (0~1) Connector

J7 : Audio CD-IN Connector

J9 : IR Interface (1*6 Pin Header)

Pin No.	Signal Description
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX
6	NC

J10 : LCD LVDS Connector (2*15 Pin Hirose)

Pin No.	Signal Description	Pin No.	Signal Description
1	+LCD	2	+LCD
3	LVDSA_DATA0	4	LVDSA_DATA#0
5	LVDSA_DATA 1	6	LVDSA_DATA#1
7	LVDSA_DATA 2	8	LVDSA_DATA#2
9	NC	10	NC
11	LVDSA_CLKP	12	LVDSA_CLKM
13	NC	14	NC
15	GND	16	GND
17	LVDSB_DATA 0	18	LVDSB_DATA #0
19	LVDSB_DATA 1	20	LVDSB_DATA #1
21	LVDSB_DATA 2	22	LVDSB_DATA #2
23	NC	24	NC
25	LVDSB_CLKP	26	LVDSB_CLKM
27	NC	28	NC
29	GND	30	GND

J11 : Inverter Power Connector (1*5 Pin wafer)

Pin No.	Signal Description
1	VCC
2	GND
3	+12V
4	GND
5	BACKLIGH_EN

J13 : System Fan1 Connector (1*3 Pin Wafer)

Pin No.	Signal Description
1	Fan Smart Speed
2	+12V
3	Fan Speed Detect

J14 : System Panel Connectors (2*5 Pin Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	5VSB CON	2	Power ON_SW
3	RST_SW	4	GND
5	VCC3 CON	6	HDD LED
7	5VSB CON	8	Suspend LED
9	GND	10	Power LED

J15 : PCI Express*16 Slot

J17 : USB (4~5) Connector (2*5-1 Pin Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	+ 5V	2	+ 5V
3	USB_D4-	4	USB_D5-
5	USB_D4+	6	USB_D5+
7	GND	8	GND
9		10	NC

J18 : USB (6~7) Connector (2*5-1 Pin Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	+ 5V	2	+ 5V
3	USB_D4-	4	USB_D5-
5	USB_D4+	6	USB_D5+
7	GND	8	GND
9		10	NC

J19 : PCI Express*1 Slot

J20 : GPIO Connector (2*5 Pin Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	GPI4	2	GPO0
3	GPI 5	4	GPO1
5	GPI 6	6	GPO2
7	GPI 7	8	GPO3
9	GND	10	+5V

J21 : GPIO Connector (2*1 Pin Header)

Pin No.	Signal Description
1	GPIO_35
2	GND

J22 : GPIO Connector (2*1 Pin Header)

Pin No.	Signal Description
1	GPIO_34
2	GND

J23 : CPU Fan Connector (1*3 Pin Wafer)

Pin No.	Signal Description
1	Fan Speed Detect
2	+5V
3	GND

J24 : System Fan2 Connector (1*3 Pin Wafer)

Pin No.	Signal Description
1	Fan Speed Detect
2	+12V
3	Fan Speed Detect

J25 : COM4 (RS-232) (2*5-1 Pin Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	DCD#4	2	RXD#4
3	TXD#4	4	DTR#4
5	GND_COM4	6	DSR#4
7	RTS#4	8	CTS#4
9	V_RI4	10	

J26 : Compact Flash Connector (Vertical type)

Pin No.	Signal Description	Pin No.	Signal Description
1	GND	26	N/C
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	GROUND	33	GROUND
9	GROUND	34	IOR#
10	GROUND	35	IOW#
11	GROUND	36	VCC_COM
12	GROUND	37	IRQ15
13	VCC	38	VCC
14	GROUND	39	CSEL
15	GROUND	40	N/C
16	GROUND	41	HDD_RESET
17	GROUND	42	IORDY

18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	PDIAG#
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	N/C	50	GROUND

J27 : COM3 (RS-232) (2*5-1 Pin Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	DCD#4	2	RXD#4
3	TXD#4	4	DTR#4
5	GND_COM4	6	DSR#4
7	RTS#4	8	CTS#4
9	V_RI4	10	

J28 : Floppy Disk Driver Connector

J29 : SATA2 Connector

J30 : SATA1 Connector

J31 : ATX Power In Connector (2*10 Pin)

Pin No.	Signal Description	Pin No.	Signal Description
1	+3V3	11	+3V3
2	+3V3	12	-12V
3	GND	13	GND
4	+5V	14	Power ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	NC
9	+5VSB	19	+5V
10	+12V	20	+5V

J32 : Print Port Connector (2*13 Pin Box Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	STB	2	AFD
3	PRD0	4	ERR
5	PRD1	6	INIT
7	PRD2	8	SLIN
9	PRD3	10	GND
11	PRD4	12	GND
13	PRD5	14	GND
15	PRD6	16	GND
17	PRD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	GND

J33 : Primary IDE Interface Connector (2*20-1 Pin Box Header)

Pin No.	Signal Description	Pin No.	Signal Description
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	CABLE SELECT
29	IDE DACK	30	GROUND
31	INTERRUPT	32	N/C
33	SA1	34	66DET
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

J34 : Compact Flash Connector (Horizontal type)

Pin No.	Signal Description	Pin No.	Signal Description
1	GND	26	N/C
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	GROUND	33	GROUND
9	GROUND	34	IOR#
10	GROUND	35	IOW#
11	GROUND	36	VCC_COM
12	GROUND	37	IRQ15
13	VCC	38	VCC
14	GROUND	39	CSEL
15	GROUND	40	N/C
16	GROUND	41	HDD_RESET
17	GROUND	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	PDIAG#
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	N/C	50	GROUND

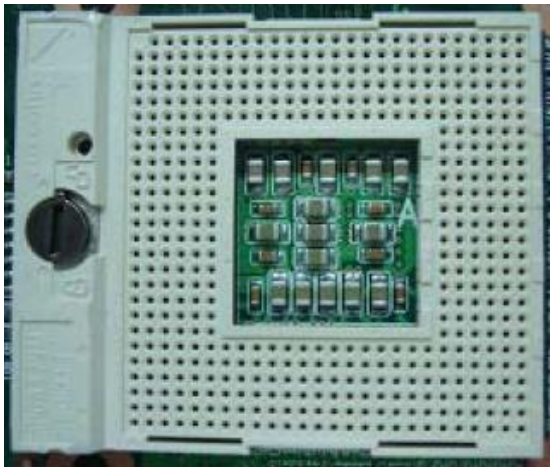
Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

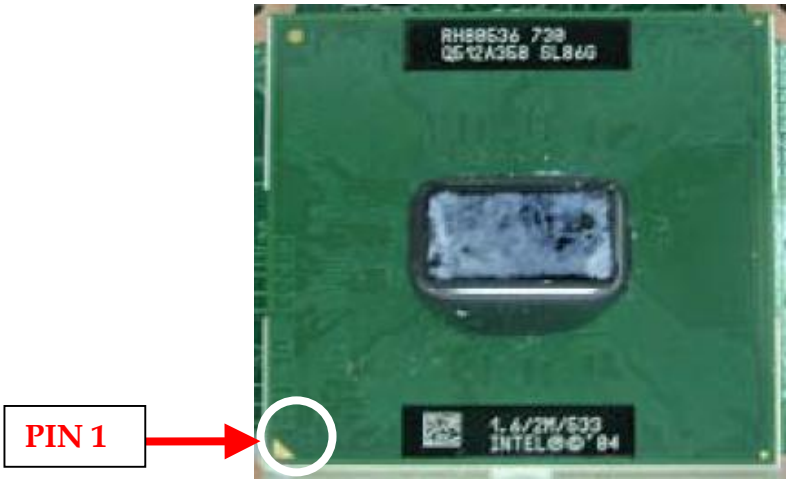
3.1 Intel® Pentium M / Celeron M Processor

Installing Intel mPGA479M CPU Socket

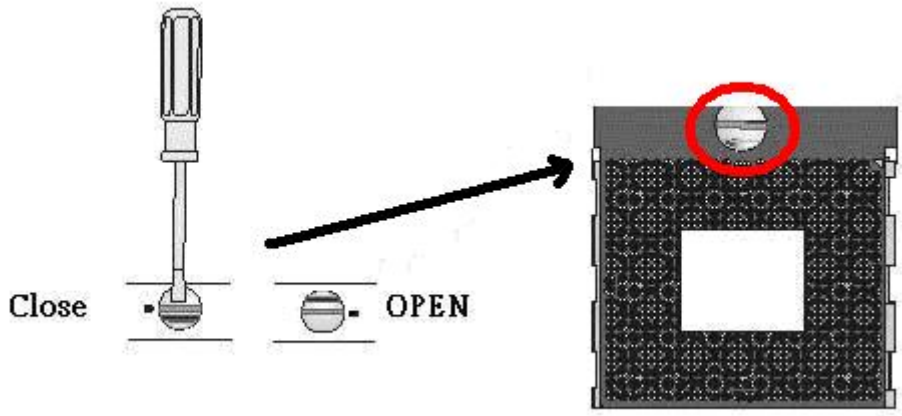
1) Lift the handling lever of CPU socket outwards and upwards to the other end.



2) Align the processor pins with pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place . If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.



3) Push down the lever to lock processor chip into the socket once CPU fits.



4) Follow the installation guide of cooling fan or heat sink to mount it on CPU surface and lock it on the mPGA479M socket.

Removing CPU

1) Unlock the cooling fan first.
2) Lift the lever of CPU socket outwards and upwards to the other end.
3) Carefully lifts up the existing CPU to remove it from the socket.
4) Follow the steps of installing a CPU to change to another one or place handling bar to close the opened socket.

Configuring System Bus

RUBY-7720VG2A will automatically detect the CPU FSB 400/533MHz used. CPU speed of Intel Pentium M Processor for Mobile and Celeron M can be detected automatically.

JP11 : CPU Type Setup

JP11	Signal Description
1-2 Short	BANIAS(1.8V)
2-3 Short	DOTHAN(1.5V)

Note:
Wrong voltage selection may damage the CPU. Please survey the CPU's type before setup this jumper setting.

JP10 : CPU FSB Setup

JP10	Signal Description
1-2 Short	FSB 400MHz
2-3 Short	FSB 533MHz

Notes:
1) The DDR2 frequency is followed the CPU FSB frequency. For example, the DDR2 module populated is DDR2 533; the CPU must be 533MHz FSB. Please use same frequency of memory module and CPU.
2) Neither CPU/DDR=533/400 nor 400/533 are allowed. This is the limitation of 915GME chipset.

3.2 Main Memory

RUBY-7720VG2A provide 2 x 240-pin DIMM sockets which supports 1.8V DDR2-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory size can be up to 2GB capacity. Memory clock and related settings can be detected by BIOS via SPD interface.

Memory frequency / CPU FSB synchronization

RUBY-7720VG2A supports different memory frequencies depending on the CPU front side bus and the type of DDR2 DIMM.

CPU FSB	Memory Frequency
533MHz	533/400MHz
400MHz	400MHz

3.3 Installing the Single Board Computer

To install your RUBY-7720VG2A into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place RUBY-7720VG2A into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

The chipset on RUBY-7720VG2A is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 /XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in RUBY-7720VG2A CD-title.

3.3.2 Intel Integrated Graphics GMCH Chip

Using GMCH High performance graphic integrated chipset is aimed to gain an outstanding graphic performance. Shared 64 accompany it to 160MB system DDRII-DRAM with Total Graphics Memory. This combination makes RUBY-7720VG2A an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI or PCI Express VGA Card can take over the system display.

Please find Intel 915 Graphic driver in the RUBY-7720VG2A CD-title. Drivers support Windows 2000 / XP.

3.3.3 Realtek Gigabit Ethernet Controller

Drivers Support

Please find Reatlek 8111B LAN driver in /Ethernet directory of RUBY-7720VG2A CD-title. The drivers support Windows 2000 /XP.

LED Indicator (for LAN status)

RUBY-7720VG2A provides two LED indicators to report Reatlek 8111B Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

<table>
<tr><th rowspan="2">Reatlek 8111B</th><th rowspan="2">Color</th><th rowspan="2">Name of LED</th><th colspan="3">Operation of Ethernet Port</th></tr>
<tr><th colspan="2">Linked</th><th>Active</th></tr>
<tr><td>Status LED</td><td>Green</td><td>Linked & Active LED</td><td colspan="2">On</td><td>Blinking</td></tr>
<tr><td rowspan="2">Speed LED</td><td>Orange</td><td rowspan="2">Speed LED</td><td>Giga Mbps</td><td>100 Mbps</td><td>10 Mbps</td></tr>
<tr><td>Green</td><td>Orange</td><td>Green</td><td>Off</td></tr>
</table>

3.3.4 Audio Controller

Please find Realtek ALC262 Audio driver form RUBY-7720VG2A CD-title. The drivers support Windows 2000 /XP.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP6	Function
1-2 Short	Clear CMOS contents
2-3 Short	Normal Operation ★

To correctly operate CMOS Clear function, users must turn off the system, move JP6 jumper to short pin 1 and 2. Move the JP6 back to 2-3 position (Normal Operation) and start the system. System will then produce a "CMOS Check Sum Error" message and hold up. Users may then follow the displayed message to load BIOS default setting.

3.5 WDT Function

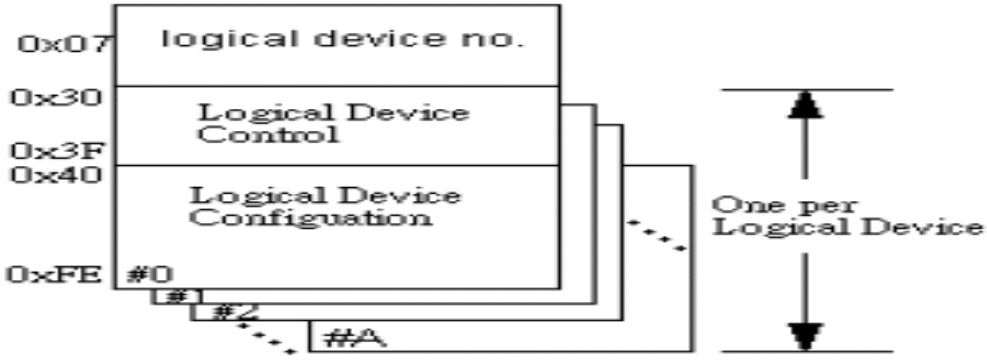
The algorithm of the WDT function can be simply described as a timer counting process with an output event. The Time-Out period (T_{wd}) can be set by software commands or hardware jumpers that depend on the board circuit design and may be different among the boards. This timer can be used to monitor a software hang.

RUBY-7720 allows users to control WDT by issuing dynamic software commands. The WDT starts counting when it is activated. It will cause a system reset once it expires. Before WDT expires, a refreshing command with a T_{wd} can be issued to re-count WDT and continue the status monitoring. If the system encounters a software or application hang, WDT will generate a system reset after its timeout.

The related Control Registers of WDT are included in the following programming guide that is written in C language. User can write a non-zero value (defined as T_{wd}) into the Time-out Value Register (CR_T_{wd}) to enable WDT. Users can write 0x00 and then T_{wd} to CR_T_{wd} to refresh WDT. To refresh WDT, the time tolerance of refreshing interval must be considered. The smaller of T_{wd}, the more deviation of WDT and you need to include more tolerance. "Let T_{wd} be longer than 2 seconds" is the recommendation due to the limitation of Winbond W83627HG WDT. You can call Portwell support center for reference. The value read back from CR_T_{wd} indicates the counting down value instead of the original T_{wd}. System will be reset after the

Time-out Value to be counted down to zero. Users can directly fill a zero value into CR_T_{wd} to disable WDT immediately. To ensure a successful access to the desired Control Register, the following programming guide should be followed.

Programming guide:
CR: Configuration Register.
LD: Logical Device of SIO. There are 11 LDs in W83627HG SIO.
CR00~2F: Global Control Registers. (All LDs share these CRs)
CR07: LD selection.
CR30~FF: Each LD has its own CR30~FF.



There are two I/O ports as I/O access window for configuring WDT,
1) IO port 0x2E is H/W strapped and named as EFIR (Extended Function Index Register, for identifying CR index number)
2) IO port 0x2F is H/W strapped and named as EFDR (Extended Function Data Register, for accessing desired CR)

<< How to access W83627HG Configuration Register >>
First, it needs to enter extended function mode.
Enter extended function mode for accessing W83627HG configuration registers:

```
outportb(EFIR, 0x87);
outportb(EFIR, 0x87);  // double IO write
```

Read Configuration Register CR_rx, and keep this byte to unsigned char al_char

```
outportb(EFIR, CR_rx ) ;
al_char = inportb(EFDR) ;
```

Write Configuration Register CR_wx with byte al_char1 ;

```
outportb(EFIR, CR_wx ) ;
outportb(EFDR, al_char1);
```

Exit extended mode after completion of configuration register access.

```
outportb(EFIR, 0xaa);
```

<< How to access W83627HG WDT Configuration Register >>
Must enter extended function mode first , then follow the following steps for accessing WDT registers.

Step(1) : CR2B_bit4P0
Initialize the multiplex pin (pin89) to WDTO function

```
outportb ( EFIR , 0x2B ) ;                  // al_char1 : unsigned char
al_char1 = inportb ( EFDR ) & 0xEF ;  // CR2B_bit4P0
outportb ( EFIR , 0x2B ) ;                  // init pin 89 to WDT
outportb ( EFDR , al_char1 ) ;
```

Step(2) : CR07_P08
Ponit to LD8.

```
outportb ( EFIR , 0x07 ) ;
outportb ( EFDR , 0x08 ) ;
```

Step(3) : LD8_CR30_bit0P1
Activate LD8

```
outportb ( EFIR , 0x30 ) ;
al_char1 = inportb ( EFDR ) | 0x01 ;  // CR30_bit0P1
outportb ( EFIR , 0x30 ) ;                  // Activate LD8
outportb ( EFDR , al_char1 ) ;
```

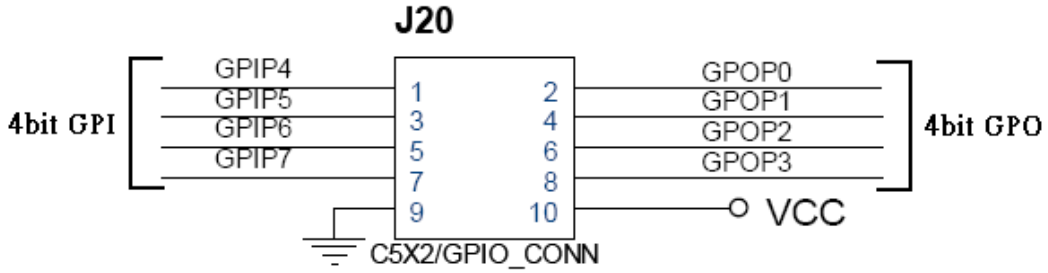
Step(4) : LD8_CRF7_bit[7,6]P[0,0]
Not allow K/B and Mouse's interrupts to reload WDT timer.

```
outportb ( EFIR , 0xF7 ) ;
al_char1 = inportb ( EFDR ) & 0x3F ;  // CRF7_bit[7,6]P[0,0]
outportb ( EFIR , 0xF7 ) ;
outportb ( EFDR , al_char1 ) ;
```

Step(5) : Refresh WDT before it expires.
Once WDT expires , system will be reset.
LD8_CRF5_bit3 : 0 : second unit
1 : minute unit
LD8_CRF6 : T_{wd} , "Writing 00" means "disable WDT"
1~255 time unit(time unit : second, minute)

Notes:
"CR2B_bit4P0" means "Write 0 to bit4 of Configuration Register 0x2B".

3.6 GPIO



J22 : General Purpose Input/Output Interface Connector

There are 8 GPIO pins on RUBY-7720VG2A. GP0, GP1, GP2 and GP3 are dedicated GPO pins with 100mA current sink capacity at 5V signal level. The output signals have internal weak pull-high resistance, 4.7K Ohm, to 5V. The GPO signals are driven by W83627HG SGP0 ~ 3 pins with four inverted gates.

GP4, GP5, GP6 and GP7 are dedicated GPI pins. They are first inverted and then connected to W83627HG SGP4~7 pins.

Refer to the W83627HG data sheet to configure both input / output port , SGP0~7, by programming W83627HG GPIO registers. To read/write these 8 GPIO pins is simply to read /write W83627HG SGP0~7 data register with setting inversed register bits due to there are inversed logical gates existing between this GPIO connector, J20, and W83627HG SGP0~7 pins.

3.6.1 Pin assignment

J22 : General Purpose I/O Connector

PIN No.	Signal Description
1	General Purpose Input Port 4
2	General Purpose Output Port 0
3	General Purpose Input Port 5
4	General Purpose Output Port 1
5	General Purpose Input Port 6
6	General Purpose Output Port 2
7	General Purpose Input Port 7
8	General Purpose Output Port 3
9	Ground
10	+5V

3.6.2 Programming Guide:

Must enter extended function mode (Double I/O write 0x87 to EFIR) first, then follow the following steps for accessing GPIO pins. When completion of GPIO access, Exit extended mode (I/O write 0xaa to EFIR).

(1) Initialize W83627HG multiplex pins to SGP0~7 function
CR2A_bit[7:3]P[1,1,1,1,1]

```
outportb ( EFIR , 0x2A ) ;                 // al_char1 : unsigned char
al_char1 = inportb ( EFDR ) | 0xF8 ;  // CR2A_bit[7:3]P[1,1,1,1,1]
outportb ( EFIR , 0x2A ) ;                // init SGP0~7 function
outportb ( EFDR , al_char1 ) ;
```

(2) Point to LD7 (for SGP0~7 GPIO port registers) and activate its function
CR07_P07 ; Point to LD7

```
outportb ( EFIR , 0x07 ) ;
outportb ( EFDR , 0x07 ) ;
```

LD7_CR30_bit0P1 ; Activate LD7

```
outportb ( EFIR , 0x30 ) ;
al_char1 = inportb ( EFDR ) | 0x01 ;  // CR30_bit0P1
outportb ( EFIR , 0x30 ) ;                // Activate LD7
 outportb ( EFDR , al_char1 ) ;
```

(3) LD7_CRF2_PFF ; Inverse input/output signals

```
outportb ( EFIR , 0xF2 ) ;
outportb ( EFDR , 0xFF ) ;
```

(4) LD7_CRF0_PF0 ; Set SGP0~3 as GPO pins and

```
outportb ( EFIR , 0xF0 ) ; SGP4~7 as GPI pins
outportb ( EFDR , 0xF0 ) ;
```

(5) LD7_CRF1 ; Data Register for reading/writing data to GPIO pins
; E.g. if put four jumper caps on J20 pin1-2,3-4,5-6,and 7-8
; (Warning : J20 pin9-10 is not allowed to be short circuit.)
; and then Write [1,0,1,0] to bit[3:0] , you can get [1,0,1,0] from
; bit[7:4].

Chapter 4
BIOS Setup Information

RUBY-7720VG2A is equipped with the AWARD BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, RUBY-7720VG2A communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4.1 Entering Setup

Turn on or reboot the computer. Wait the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

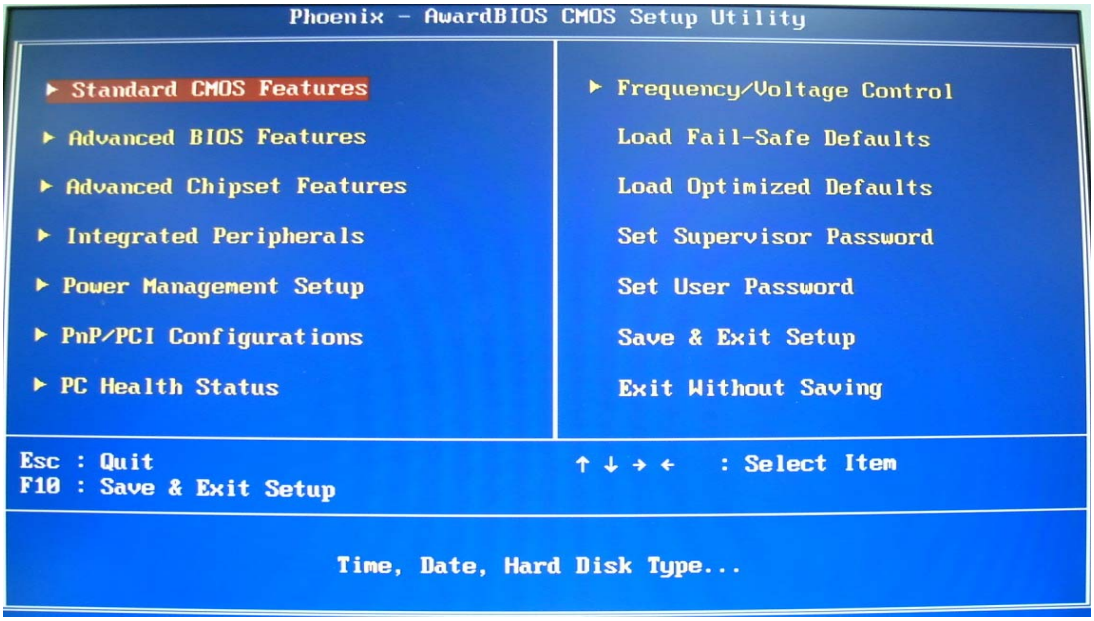
Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table as below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓ → ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

4.2 Main Menu

Once you enter RUBY-7720VG2A AWARD BIOS CMOS Setup Utility, a Main Menu is presented. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

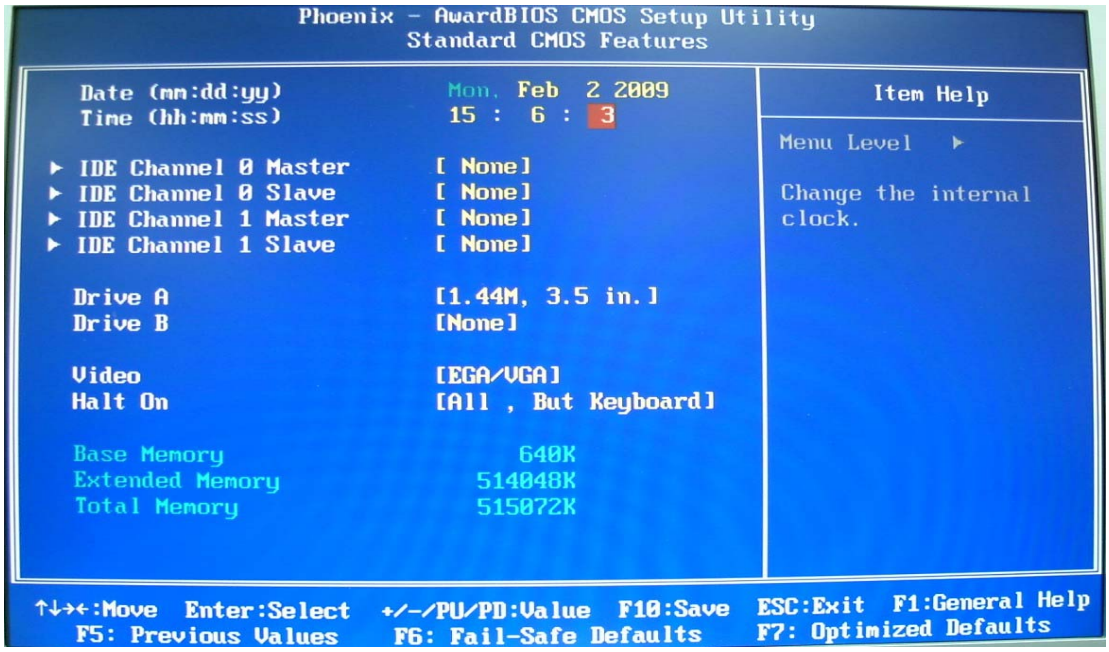


Note:
It is strongly recommended to reload Optimum Setting if CMOS is lost or BIOS is updated.

4.3 Standard CMOS Setup Menu

This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change **Date**, **Time**, **Drive type**, and **Boot Sector Virus Protection Status**.


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Mon, Feb 2 2009
Time (hh:mm:ss) 15 : 6 : 3
IDE Channel 0 Master [None]
IDE Channel 0 Slave [None]
IDE Channel 1 Master [None]
IDE Channel 1 Slave [None]
Drive A [1.44M, 3.5 in.]
Drive B [None]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 640K
Extended Memory 514048K
Total Memory 515072K
Item Help
Menu Level ▸
Change the internal clock.
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

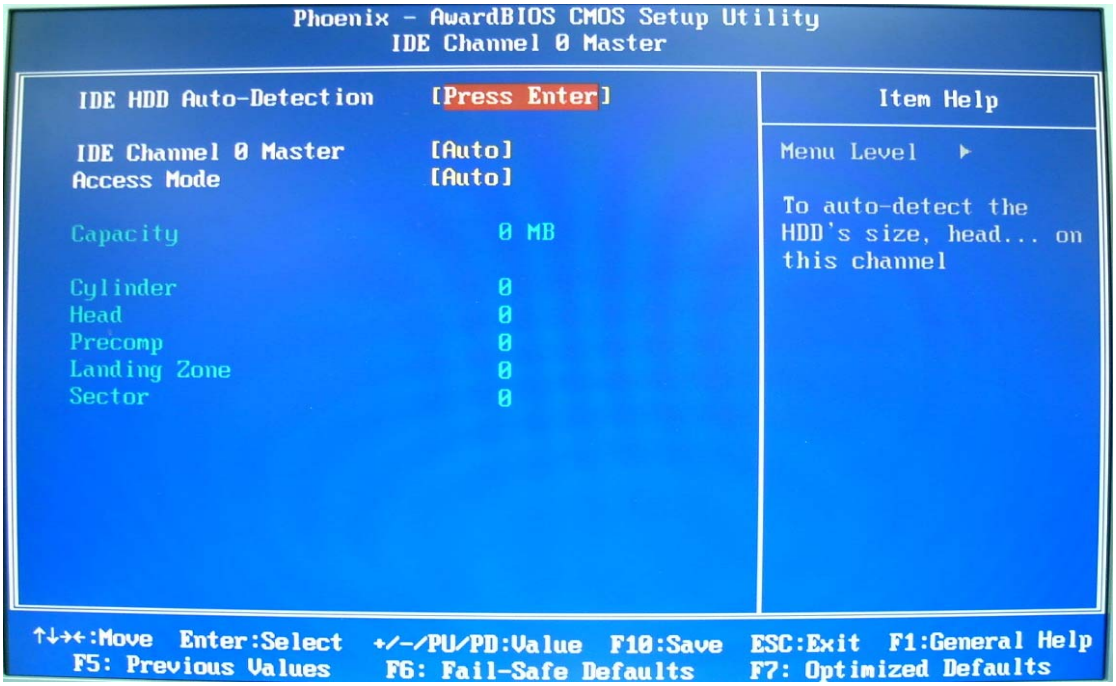
Note:
Oblique parameters are base on memory capacity which user adopts on single board.

■ **Menu Selections**

Item	Options	Description
Date	mm:dd:yy	Change the day, month, year and century
Time	hh:mm:ss	Change the internal clock
IDE Channel 0 Master	Options are in its sub menu (described in Table of section 4.4)	Press <Enter> to enter the sub menu of detailed options
IDEChannel 0 Slave		
IDE Channel 1 Master		
IDE Channel 1 Slave		
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All But Keyboard	All Errors: The boot process will halt on all errors. No Errors: The POST will not stop of any type of error. All But Keyboard: The boot process will stop for any error except a keyboard error.
Base Memory	640K	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

4.4 IDE Adaptors Setup Menu

The IDE adapters control the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive.


Phoenix - AwardBIOS CMOS Setup Utility
IDE Channel 0 Master
IDE HDD Auto-Detection [Press Enter]
IDE Channel 0 Master [Auto]
Access Mode [Auto]
Capacity 0 MB
Cylinder 0
Head 0
Precomp 0
Landing Zone 0
Sector 0
Item Help
Menu Level ▸
To auto-detect the HDD's size, head... on this channel
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
The oblique items are meaning base on what kind of storage device user employs.

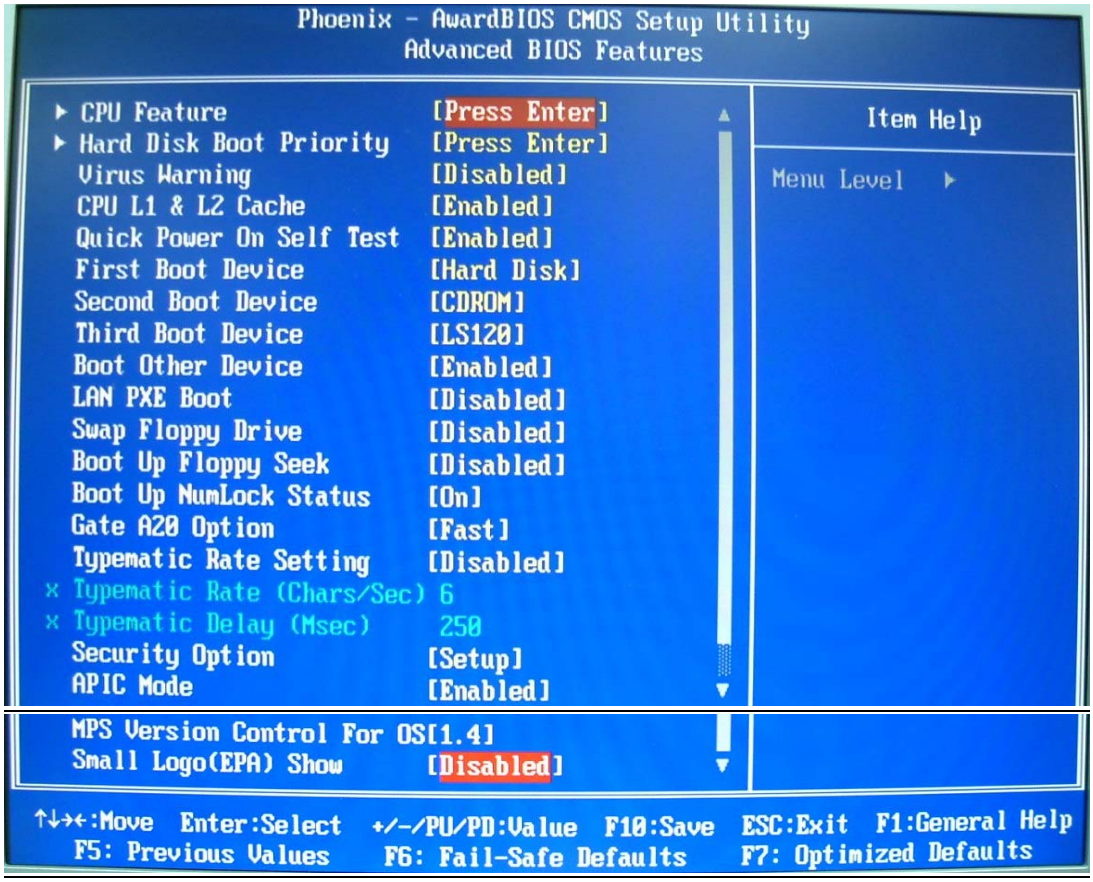
■ **Menu Selections**

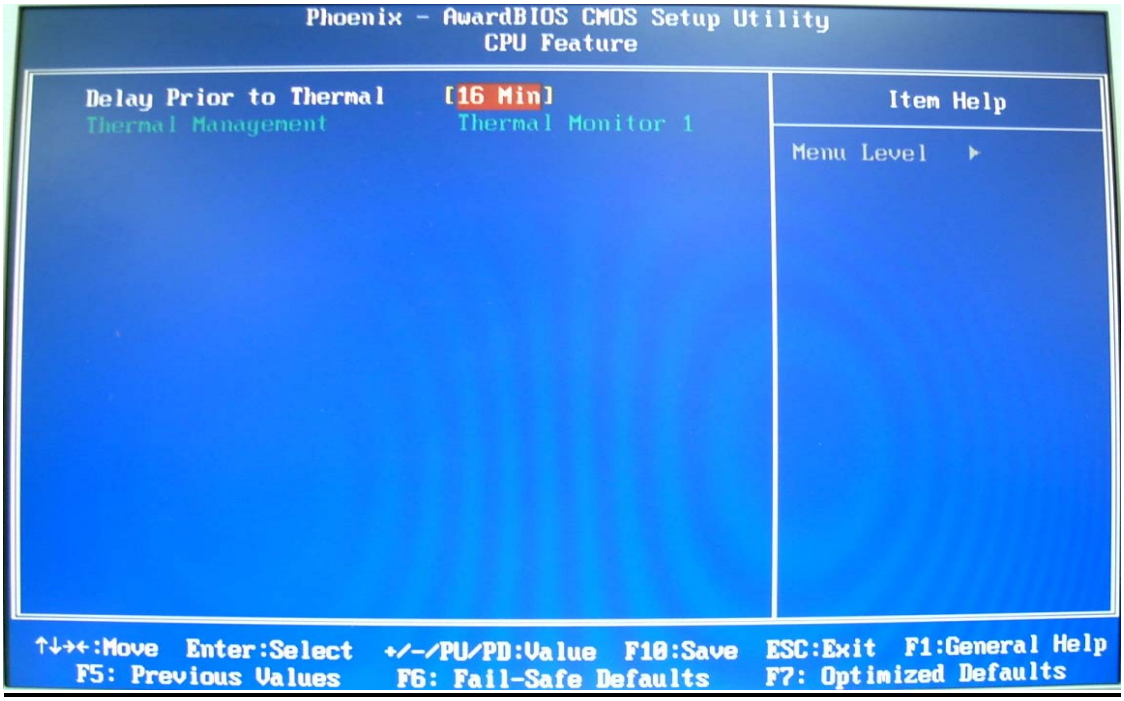
Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0/ Channel 1 Master or Slave	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	CHS, LBA Large, Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		

Cylinder	Min=0, Max=65535	Set the number of cylinders for hard disk
Head	Min=0, Max=255	Set the number of read/write heads
Precomp	Min=0, Max=65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min=0, Max=65535	****
Sector	Min=0, Max=255	Number of sectors per track

4.5 Advanced BIOS Features

This section allows user to configure your system for basic operation. The system's default speed, boot-up sequence, keyboard operation, shadowing and security may be modified accordingly.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
CPU Feature [Press Enter]
Hard Disk Boot Priority [Press Enter]
Virus Warning [Disabled]
CPU L1 & L2 Cache [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [CDROM]
Third Boot Device [LS120]
Boot Other Device [Enabled]
LAN PXE Boot [Disabled]
Swap Floppy Drive [Disabled]
Boot Up Floppy Seek [Disabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Typematic Rate Setting [Disabled]
x Typematic Rate (Chars/Sec) 6
x Typematic Delay (Msec) 250
Security Option [Setup]
APIC Mode [Enabled]
MPS Version Control For OS[1.4]
Small Logo(EPA) Show [Disabled]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults


Phoenix - AwardBIOS CMOS Setup Utility
CPU Feature
Delay Prior to Thermal [16 Min]
Thermal Management Thermal Monitor 1
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

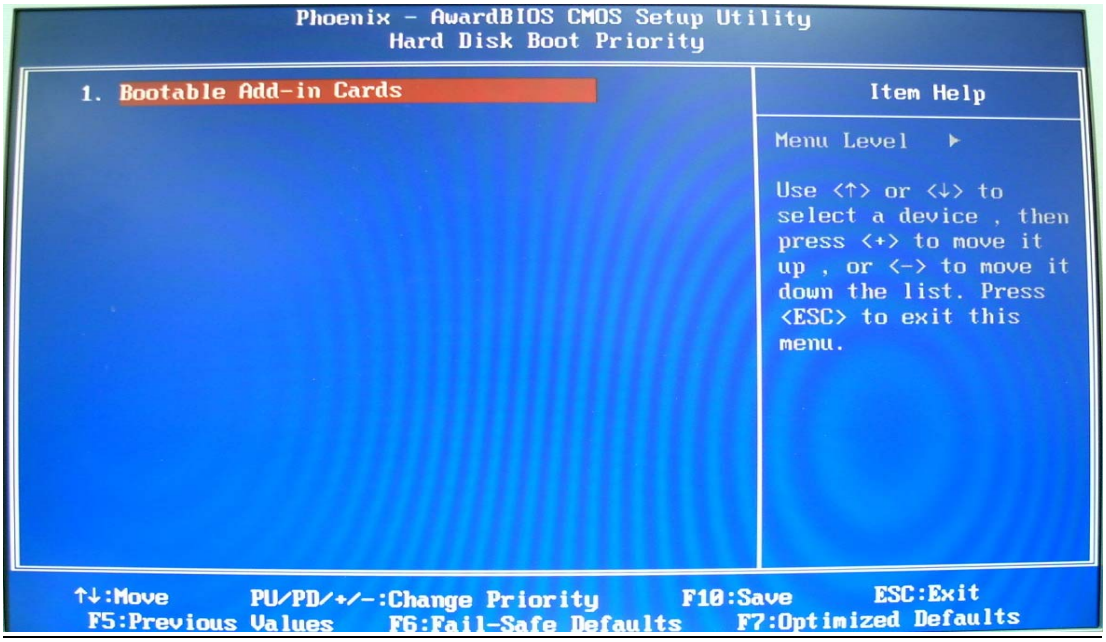
Delay Prior To Thermal

This field is used to select the time that would force the CPU to a 50% duty cycle when it exceeds its maximum operating temperature therefore protecting the CPU and the system board from overheating to ensure a safe computing environment.

Thermal Management

Select a "thermal monitor" in this field to enable the CPU's speedstep function. Restart the system then go to the operating system's "Control Panel". Double-click "Power Options". The "Power Options Properties" dialog box will appear. In the "Power Schemes" menu, select "Por table/Laptop". Speedstep reduces the CPU's frequency and voltage in accordance to its load.

Thermal Monitor 1 On die throtting.
Thermal Monitor 2 Ratio and VID transition.


Phoenix - AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority
1. Bootable Add-in Cards
Item Help
Menu Level ▶
Use <↑> or <↓> to select a device , then press <+> to move it up , or <-> to move it down the list. Press <ESC> to exit this menu.
↑↓:Move PU/PD/+/-:Change Priority F10:Save ESC:Exit
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Hard Disk Boot Priority

Select boot sequence for onboard(or add-on cards) SCSI, RAID, etc.
Use < ↑ > or < ↓ > to select a device, then press<+> to move it up, or <-> to move it down the list.
Press <ESC> to exit this menu.

Virus Warning

Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1 & L2 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

Quick Power On Self Test

Allows the system skip certain tests while booting. This will decrease the time needed to boot the system.

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third Boot Device

Select your Boot Device Priority.

The choice: Floppy, LS120, Hard Disk, CDROM, ZIP 100, USB-FDD, USB-ZIP, USB-CDROM and Disabled.

Boot Other Device

Select your Boot Device Priority.

The choice: Enabled, Disabled.

LAN PXE Boot

This function decide whether to invoke the PXE Boot ROM of the onboard LAN chip.

The choice: Enabled, Disabled.

Swap Floppy Drive

If the system has two floppy drives, choose enable to assign physical driver B to logical drive A and Vice-Versa.

The choice: Enabled, Disabled.

Boot Up Floppy Seek

Enabled tests floppy drives to determine whether they have 40 or 80 tracks.

The choice: Enables, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off, On.

Gate A20 Option

Fast-lets chipsets control Gate A20 and Normal – a pin in the keyboard controller controls Gate A20. Default is fast.

The choice: Normal, Fast.

Typematic Rate Setting

Keyboard repeat at a rate determined by the keyboard controller, when enabled, the typematic delay can be selected.

The choice: Enabled, Disabled.

※Typematic Rate (Chars/sec)

The rate is which character repeats when you hold down a key at.

The choice: 6, 8, 10, 12, 15, 20, 24, and 30. (Default 6)

※Typematic delay (Msec)

The delay before keystrokes begins to repeat.

The choice: 250, 500, 750, and 1000. (Default 250)

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note:
To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

APIC Mode

The choice: Enabled, Disabled.

MPS Version Control For OS

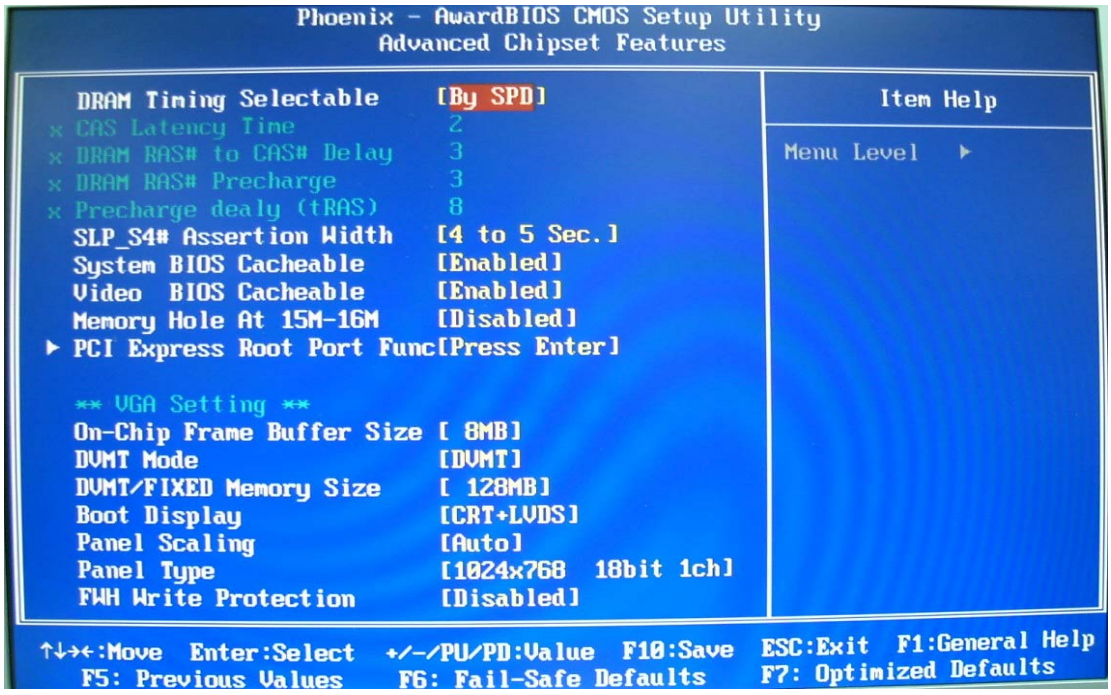
The choice: 1.1, 1.4

Small Logo (EPA) Show

Enabled	The EPA logo will appear during system boot-up.
Disabled	The EPA logo will not appear during system boot-up.

4.6 Advanced Chipset Features

This section allows user to configure the system based on the specific features of the Intel 915GME and ICH6M chipsets for RUBY-7720VG2A. This chipset manages bus speeds and access to system memory resources, such as DRAM (DDR2 SDRAM) and the external cache. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for the system. The only time user might consider making any changes would be if you discovered that data was being lost while during system operation.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
DRAM Timing Selectable [By SPD]
x CAS Latency Time 2
x DRAM RAS# to CAS# Delay 3
x DRAM RAS# Precharge 3
x Precharge dealy (tRAS) 8
SLP_S4# Assertion Width [4 to 5 Sec.]
System BIOS Cacheable [Enabled]
Video BIOS Cacheable [Enabled]
Memory Hole At 15M-16M [Disabled]
PCI Express Root Port Func [Press Enter]
** VGA Setting **
On-Chip Frame Buffer Size [8MB]
DVMT Mode [DVMT]
DVMT/FIXED Memory Size [128MB]
Boot Display [CRT+LVDS]
Panel Scaling [Auto]
Panel Type [1024x768 18bit 1ch]
FWH Write Protection [Disabled]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

DRAM Timing Selectable

This field is used to select the timing of the DRAM.
The choice: By SPD, Manual.

CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes.

Precharge Delay (tRAS)

The options are Auto, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15.

SLP_S4# Assertion Width

The options are 1 to 2 Sec., 2 to 3 Sec., 3 to 4 Sec. and 4 to 5 Sec.

System BIOS Cacheable

The choice: Enabled, Disabled.

Video BIOS Cacheable

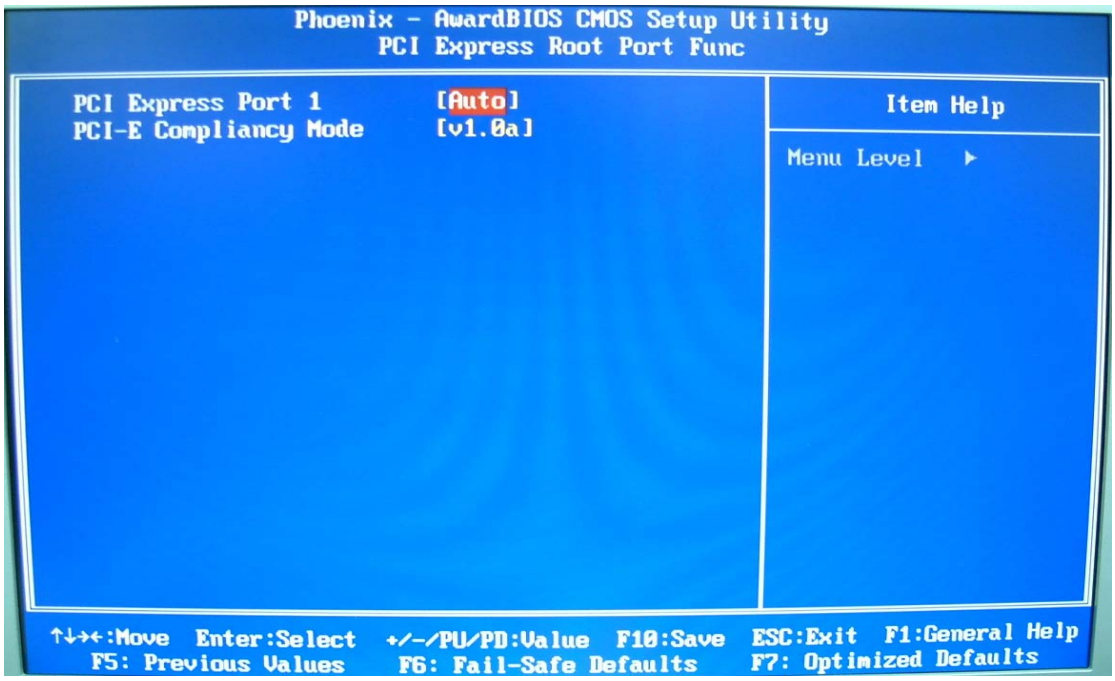
The choice: Enabled, Disabled.

Memory Hole At 15M-16M

The choice: Enabled, Disabled.

PCI Express Root Port Func

Move the cursor to this field and press <Enter>. The following screen will appear.


Phoenix - AwardBIOS CMOS Setup Utility
PCI Express Root Port Func
PCI Express Port 1 [Auto]
PCI-E Compliancy Mode [v1.0a]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

PCI Express Port 1

This field is used to enable or disable the PCI Express port function.

The choice: Auto, Enabled, Disabled.

PCI-E Compliancy Mode

This field is used to select the mode for the PCI Express add-in card.

The choice: v1.0a, v1.0.

On Chip Frame Buffer Size

The choice: 1 MB, 8 MB

DVMT Mode

This field shows the current DVMT mode. When set to Fixed Mode, the graphics driver will reserve a fixed portion of the system memory as graphics memory. When set to DVMT Mode, the graphics chip will dynamically allocate system memory as graphics memory, according to system and graphics requirements. When set to Both Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

The choice: Fixed, DVMT, Both.

DVMT/Fixed Memory Size

This field is used to select the graphics memory size used by DVMT/Fixed mode.

The choice: 64MB, 128MB.

Boot Display

The choice: CRT, LVDS, CRT+LVDS.

Panel Scaling

The choice: Auto, On, OFF.

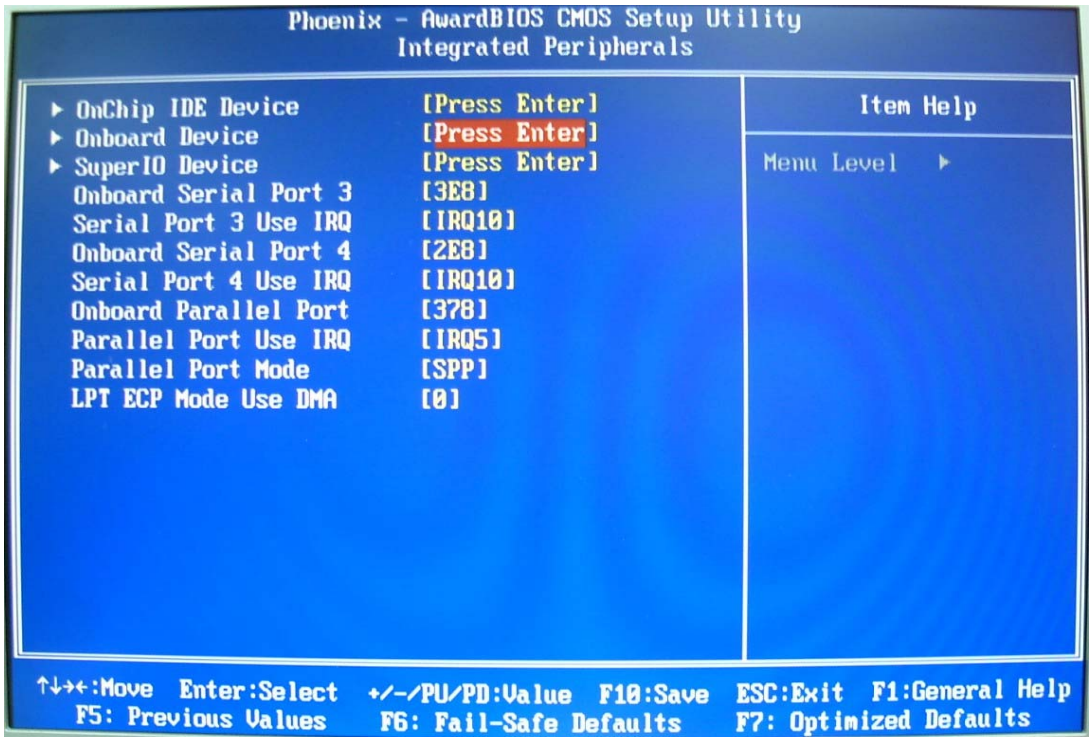
Panel Type

The choice: 640x480 18bit 1ch, 800x600 18bit 1ch, 1024x768 18bit 1ch, 1400x1050 18bit 2ch.

FWH Write Protection

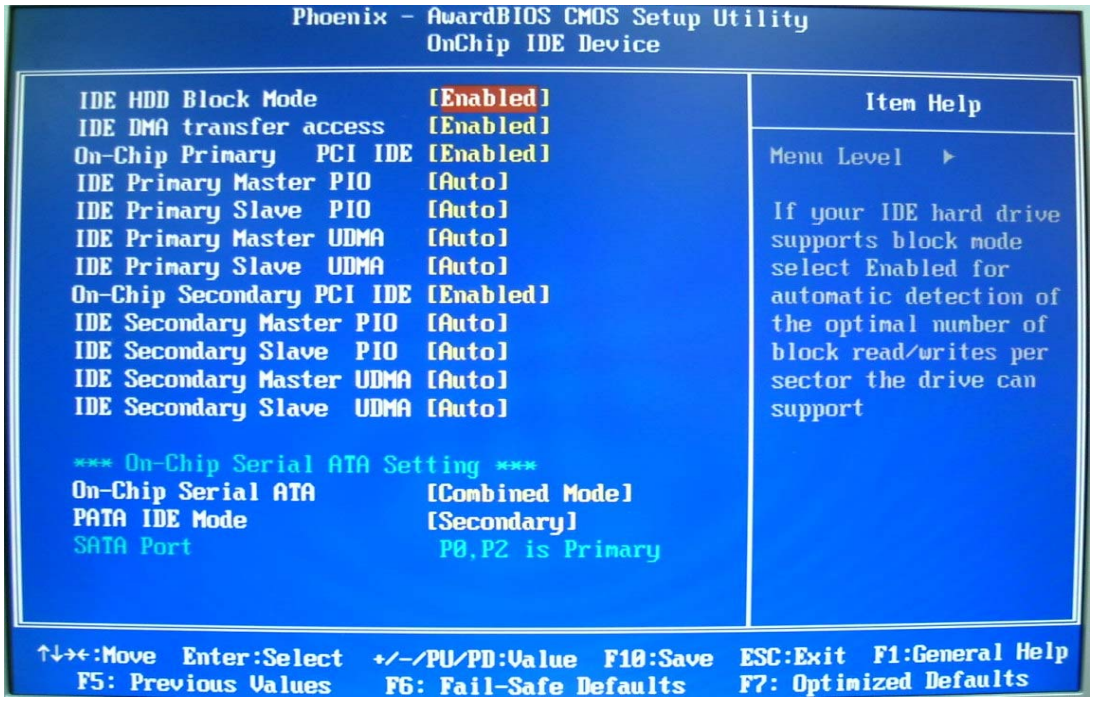
The choice: Enabled, Disabled.

4.7 Integrated Peripherals


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
Onboard Device [Press Enter]
SuperIO Device [Press Enter]
Onboard Serial Port 3 [3E8]
Serial Port 3 Use IRQ [IRQ10]
Onboard Serial Port 4 [2E8]
Serial Port 4 Use IRQ [IRQ10]
Onboard Parallel Port [378]
Parallel Port Use IRQ [IRQ5]
Parallel Port Mode [SPP]
LPT ECP Mode Use DMA [0]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

OnChip IDE Device

Move the cursor to this field and press <Enter>. The following screen will appear.


Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
IDE DMA transfer access [Enabled]
On-Chip Primary PCI IDE [Enabled]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
On-Chip Secondary PCI IDE [Enabled]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]
*** On-Chip Serial ATA Setting ***
On-Chip Serial ATA [Combined Mode]
PATA IDE Mode [Secondary]
SATA Port P0,P2 is Primary
Item Help
Menu Level ▸
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

IDE HDD Block Mode

If IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled.

IDE DMA Transfer Access

This field, when Enabled, will enhance the IDE DMA transfer of an IDE hard disk drive.

On-Chip Primary/Secondary PCI IDE

The choice: Enabled, Disabled

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields allow set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 implementation is possible only if IDE hard drive supports and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support.

The choice: Auto, Disabled.

On-Chip Serial ATA

Disabled	Disables the onboard SATA.
Auto	The system will detect the existing SATA and IDE drives then automatically set them to the available master/slave mode.
Combined Mode	This option allows you to use both IDE and SATA drives; allowing a maximum of 4 drives 1 IDE Master, 1 IDE Slave and 2 SATA;supporting maximum of 2 drives on each channel.
Enhanced Mode	This option allows you to use both IDE and SATA drives; allowing a maximum of 4 drives 1 IDE Master, 1 IDE Slave and 2 SATA.
SATA Only	This option automatically sets the SATA drives to Primary Master mode. Since the SATA drives are in Master mode, you cannot set the IDE drive to Master mode.

PATA IDE Mode

This field is used to select the function mode of the IDE connector.

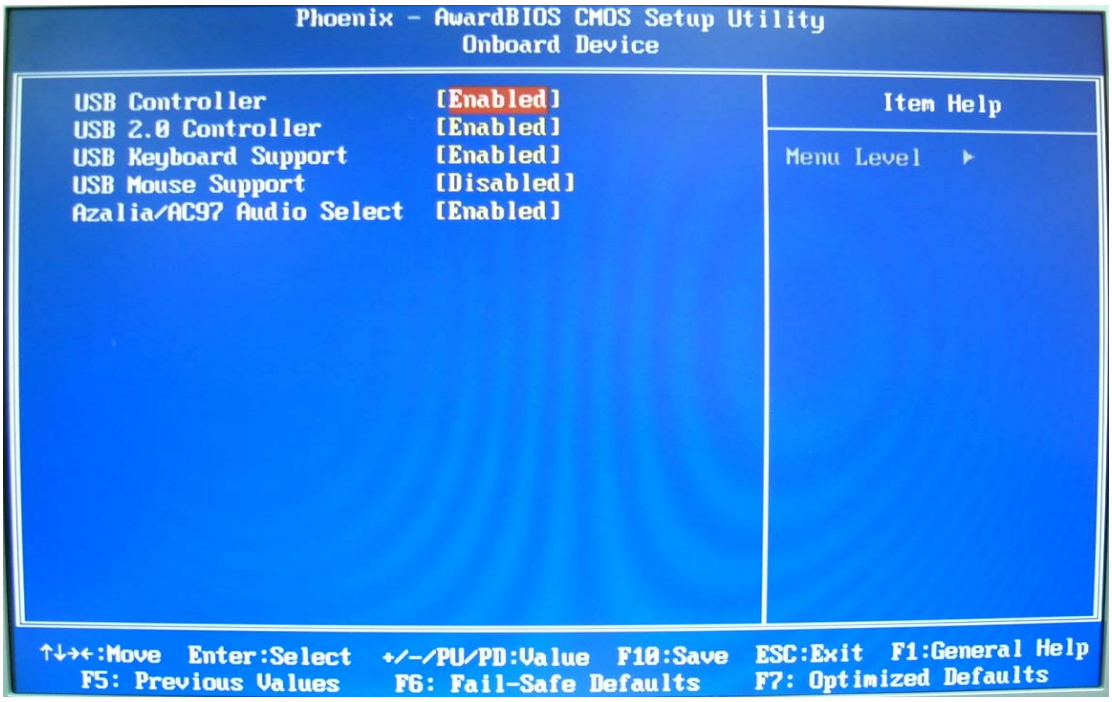
Secondary	Slave channel. SATA 1 and SATA 2 serve as Primary Master and Primary Slave channel.

SATA Port

If the “PATA IDE Mode” field is set to Primary, this field will show “P1, P3 is Secondary”; meaning SATA 0 and SATA 2 are Secondary.
If the “PATA IDE Mode” field is set to Secondary, this field will show “P0, P2 is Primary”; meaning SATA 1 and SATA 3 are Primary.

Onboard Device

Move the cursor to this field and press <Enter>. The following screen will appear.


Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device
USB Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Keyboard Support [Enabled]
USB Mouse Support [Disabled]
Azalia/AC97 Audio Select [Enabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

USB and USB 2.0 Controller

[Enabled] or [Disabled] universal host controller interface for universal serial bus.

The choice: Enabled, Disabled.

USB Keyboard/Mouse Support

Legacy support of USB keyboard or mouse.

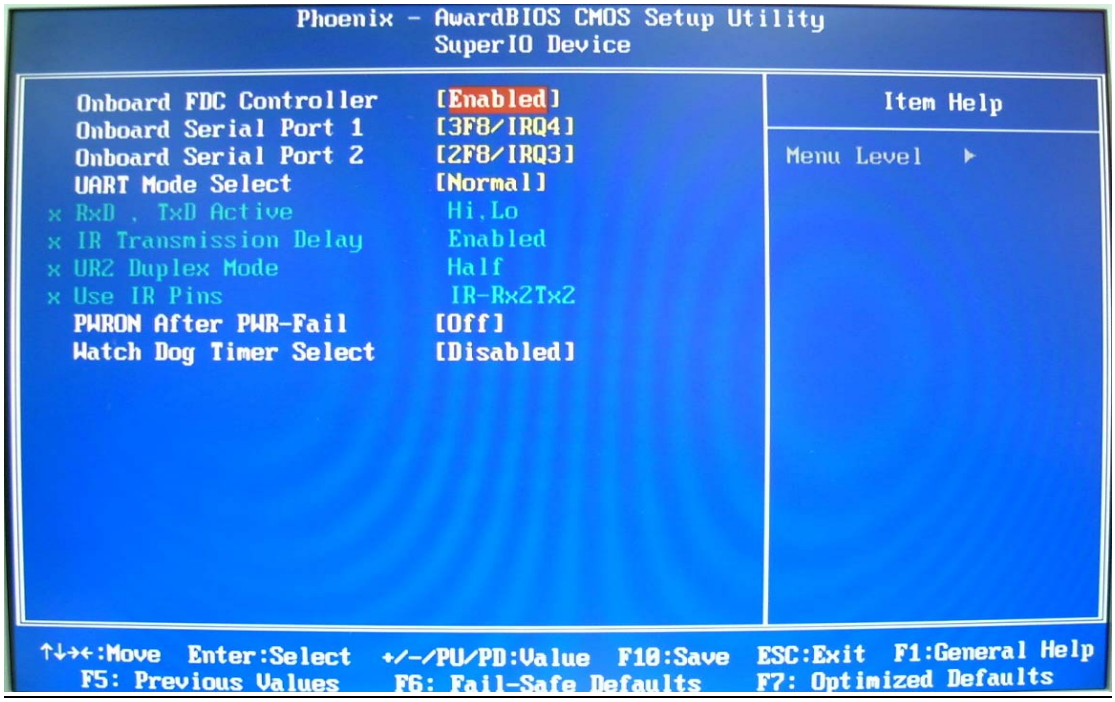
The choice: Disabled, Enabled.

Azalia/AC97 Audio Select

Enabled Select this option when using the onboard audio CODEC.
Disabled Select this option when using a PCI sound card.

The choice: Disabled, Enabled.

Super IO Device


Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device
Onboard FDC Controller [Enabled]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
UART Mode Select [Normal]
x RxD , TxD Active Hi,Lo
x IR Transmission Delay Enabled
x UR2 Duplex Mode Half
x Use IR Pins IR-Rx2Tx2
PWRON After PWR-Fail [Off]
Watch Dog Timer Select [Disabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard Serial Port 1 and Onboard Serial Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

UART Mode Select

This item allows users to select Infrared transmission mode.

Normal	Disable Infrared function
IrDA	Select IrDA mode transmission
ASKIR	Select ASKIR mode transmission

※RxD ,TxD Active

This item is to configure Infrared transmission rate. Four options are available:

Hi, Hi	High rate for receiving /High rate for transmitting
Hi, Lo	High rate for receiving /Low rate for transmitting
Lo, Hi	Low rate for receiving /High rate for transmitting
Lo, Lo	Low rate for receiving /Low rate for transmitting

※IR Transmission Delay

This option will be available when IR is enabled.

The choice: Enabled, Disabled.

※UR2 Duplex Mode

The available choices are full duplex mode and half duplex mode.

The choice: Full, Half.

※Use IR Pins

The available choices are IR-Rx2Tx2, RxD2, and TxD2.

The choice: IR-Rx2Tx2, RxD2, TxD2.

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

On	System automatically restores Power back
Off	System stays at Power-Off

Watch Dog Timer Select

The choice: Disabled, 10,20,30,40 sec, 1, 2, 4 Min.

Onboard Serial Port 3

Allows you to manual select an I/O address for the onboard serial port 3.

The choice: Disabled, 3F8, 2F8, 3E8, 2E8.

Serial Port 3 Use IRQ

Allows you manually select an IRQ for the onboard serial port 3.

The choice: IRQ 10, IRQ11, IRQ 3, IRQ 4, IRQ 5, IRQ7.

Onboard Serial Port 4

Allows you manually select an I/O address for the onboard serial port 4.

The choice: Disabled, 3F8, 2F8, 3E8, 2E8.

Serial Port 4 Use IRQ

Allows you manually select an IRQ for the onboard serial port 4.

The choice: IRQ 10, IRQ11, IRQ 3, IRQ 4, IRQ 5, IRQ7.

Onboard Parallel Port

The item allows you configure I/O address of the onboard parallel port.

The choice: 378, 278, 3BC.

Parallel Port Use IRQ

Allows you manually select an IRQ for the onboard Parallel port.

The choice: IRQ 5, IRQ7, IRQ 10, IRQ11.

Parallel Port Mode

There are three different modes for the onboard parallel port.

The choice: SPP, EPP1.9, EPP1.7.

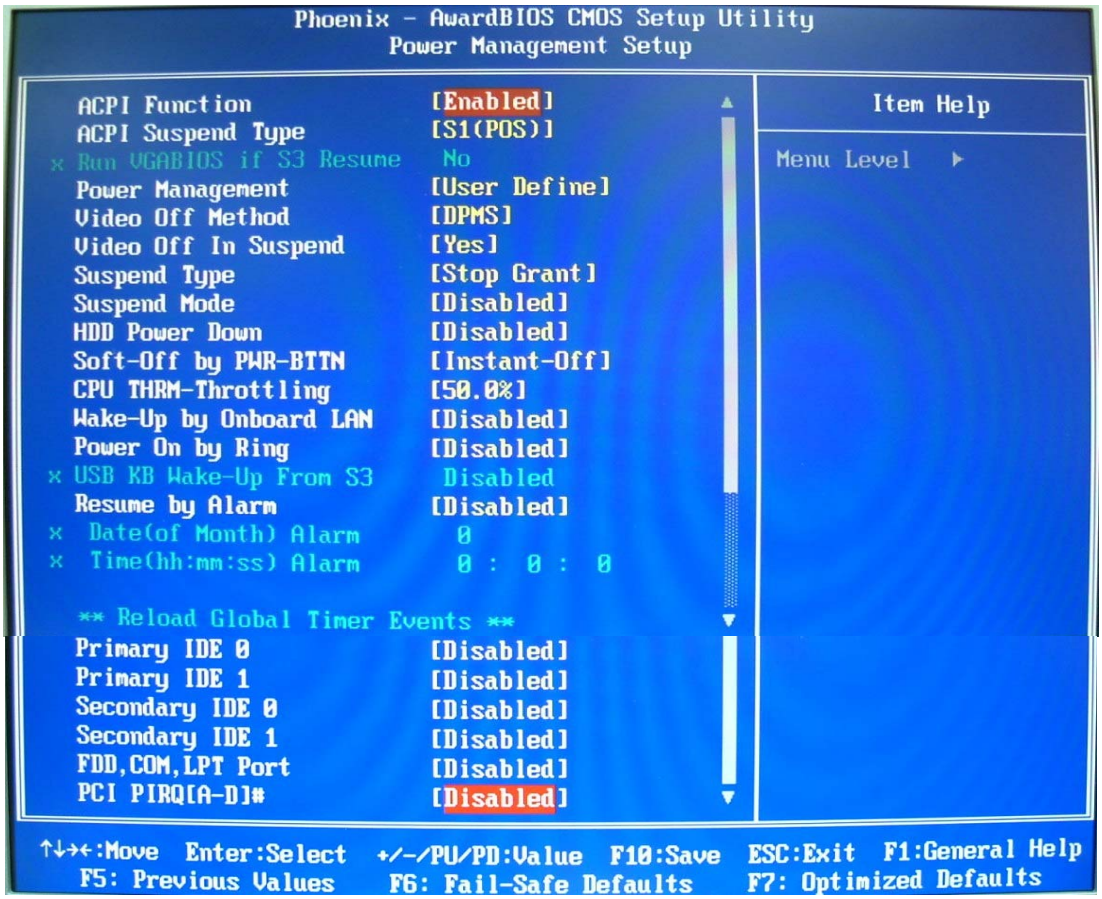
LPT ECP Mode Use DMA

Select the DMA value of the LPT ECP mode.

The choice: 0, 1, 3.

4.8 Power Management Setup

The Power Management Setup allows configuration of the system to most effectively save energy while operating in a manner consistent with your own style of computer use.


Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
ACPI Function [Enabled]
ACPI Suspend Type [S1(POS)]
x Run VGABIOS if S3 Resume No
Power Management [User Define]
Video Off Method [DPMS]
Video Off In Suspend [Yes]
Suspend Type [Stop Grant]
Suspend Mode [Disabled]
HDD Power Down [Disabled]
Soft-Off by PWR-BTTN [Instant-Off]
CPU THRM-Throttling [50.0%]
Wake-Up by Onboard LAN [Disabled]
Power On by Ring [Disabled]
x USB KB Wake-Up From S3 Disabled
Resume by Alarm [Disabled]
x Date(of Month) Alarm 0
x Time(hh:mm:ss) Alarm 0 : 0 : 0
** Reload Global Timer Events **
Primary IDE 0 [Disabled]
Primary IDE 1 [Disabled]
Secondary IDE 0 [Disabled]
Secondary IDE 1 [Disabled]
FDD,COM,LPT Port [Disabled]
PCI PIRQ[A-D]# [Disabled]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

ACPI Suspend Type

To decide which ACPI suspend mode to use.

The choice: S1 (POS)/S3 (STR).

※Run VGA BIOS if S3 Resume

The choice: Auto, Yes, No.

Power Management

This category allows selecting the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min Saving	Minimum power management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max Saving	Maximum power management. Suspend Mode = 1 Min., and HDD Power Down = 1 Min.
User Define	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.

Video off Method

This determines the manner in which the monitor is blanked.

Blank Screen	This option only writes blanks to the video buffer.
V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choice: Yes, No.

Suspend Type

Two options are available: Stop Grant and PWROn Suspend.

The choice: Stop Grant, PwrOn Suspend.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Disabled, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choice: Instant-Off, Delay 4 Sec.

CPU THRM-Throttling

Set the rate of the CPU Thermal-Throttling.

The choice: 75.0%, 50.0%, 25.0%

Wake-up by Onboard Lan

The choice: Enable, Disabled.

Power On by Ring

Select "Enabled", a system that is at soft-off mode will be alert to Wake-On-Modem.

The choice: Enabled, Disabled.

※USB KB Wake-Up From S3

The choice: Enabled, Disabled. (Default Disabled)

Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choice: Enabled, Disabled.

※Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the system.

The choice: 0 ~ 31.

※Time (hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the system.

The choice: hh (0~23), mm (0~59), ss (0 ~59).

Primary/Secondary IDE 0/1

This item is to configure IDE devices being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

FDD, COM, LPT Port

This item is to configure floppy device, COM ports, and parallel port being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

PCI PIRQ [A-D] #

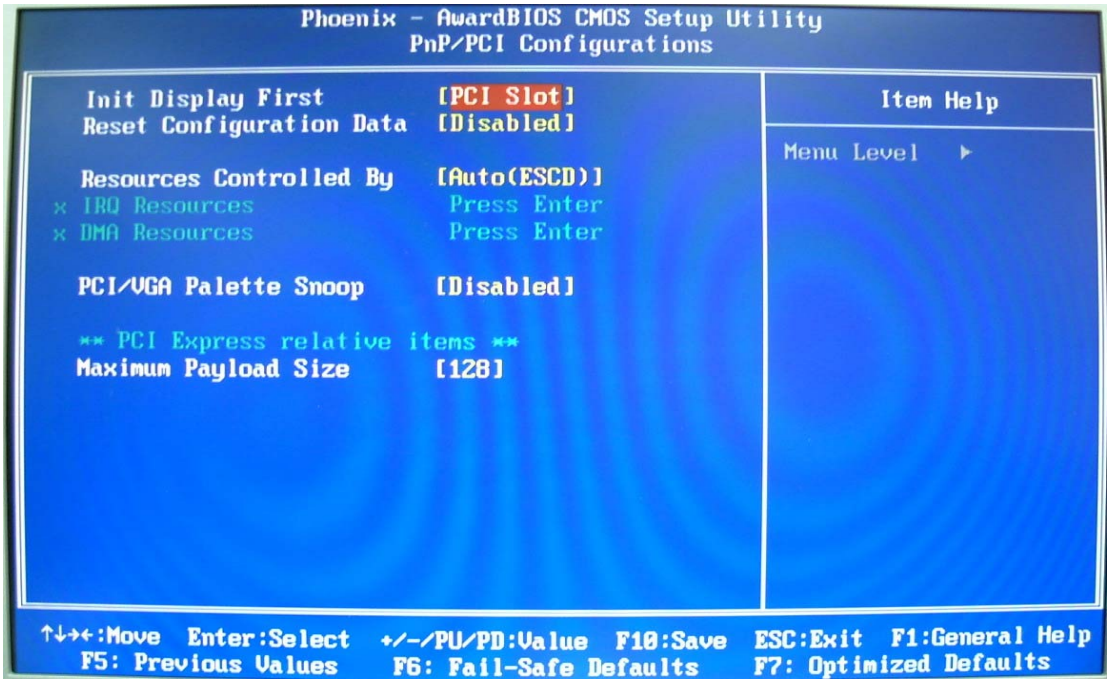
This option can be used to detect PCI device activities. If they are activities, the system will go into sleep mode.

The choice: Enabled, Disabled.

4.9 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**eripheral **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Init Display First [PCI Slot]
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
x DMA Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Init Display First

This field is used to select whether to initialize the onboard VGA, PCI Express or PCI first when the system boots.

The choice: PCI Slot, Onboard.

Reset Configuration Data

Default is disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS can not boot.

The choice: Enabled, Disabled.

Resource Controlled By

BIOS can automatically configure the entire boot and plug and play compatible devices. If set to Auto, IRQ DMA and memory base address fields can not be selected, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

※IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

The choice: Press Enter.
IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to.

The choice: PCI/ISA PnP, Legacy ISA.

※DMA Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the DMA Resource.

The choice: Press Enter.
DMA-0/DMA-1/DMA-2/DMA-3/DMA-4/DMA-5/DMA-6/DMA-7 assigned to.

The choice: PCI/ISA PnP, Legacy ISA.

PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not. The default value is Disabled.

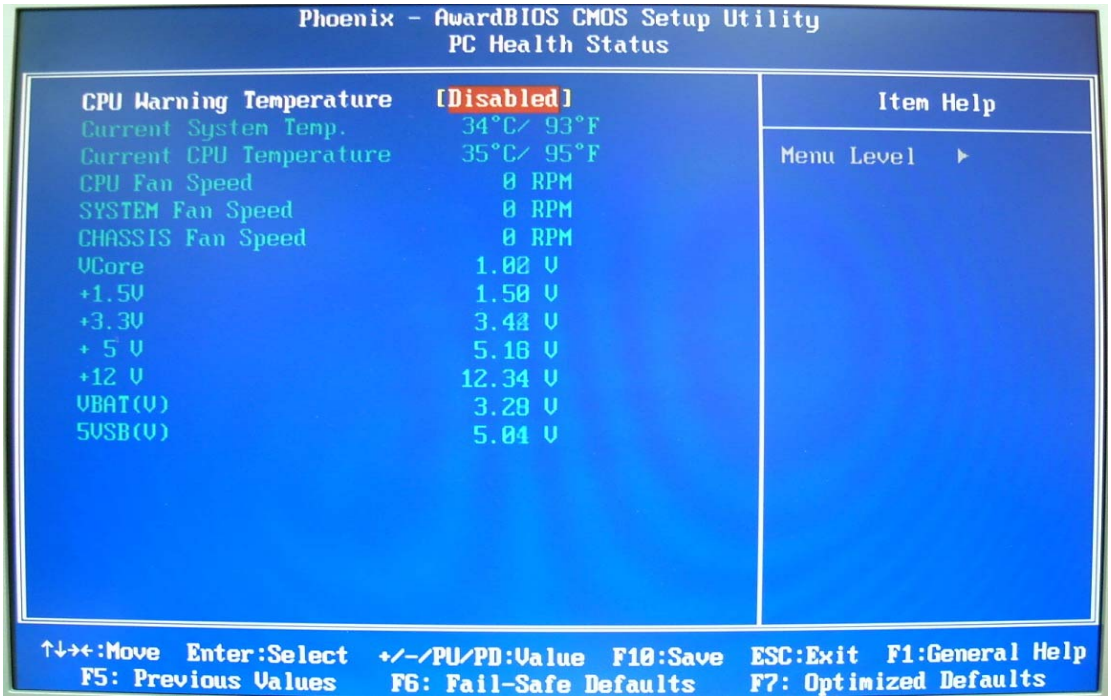
The choice: Disabled, Enabled

Maximum Payload Size

Set maximum TLP payload size for the PCI Express devices. The Unit is Byte.

The choice: 128, 256, 512, 1024, 2048, and 4096.

4.10 PC Health Status

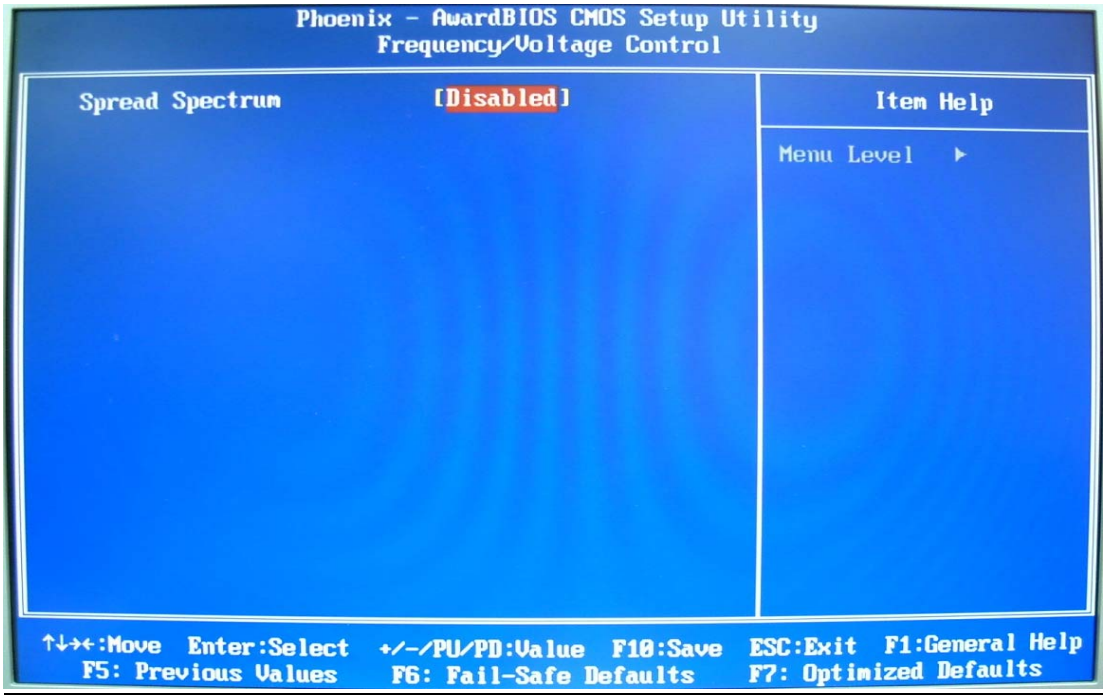

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status
CPU Warning Temperature [Disabled]
Current System Temp. 34°C/ 93°F
Current CPU Temperature 35°C/ 95°F
CPU Fan Speed 0 RPM
SYSTEM Fan Speed 0 RPM
CHASSIS Fan Speed 0 RPM
VCore 1.02 V
+1.5V 1.50 V
+3.3V 3.41 V
+ 5 V 5.16 V
+12 V 12.34 V
VBAT(V) 3.28 V
5VSB(V) 5.04 V
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU Warning Temperature

This item allows you to set a temperature above which the system will start the beeping warning. Default setting is disabled. This function will only with "ACPI" power management and "S3 (STR)" suspends type.

The choices : Disabled, 50℃/122℉, 53℃/127℉, 56℃/133℉, 60℃/140℉, 63℃/145℉, 66℃/151℉, 70℃/158℉.

4.11 Frequency/Voltage Control


Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control
Spread Spectrum
[Disabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Spread Spectrum

This item allows user to enable/disable the spread spectrum modulate.

The choice: Enabled, Disabled.

4.12 Default Menu

Selecting "Defaults" from the main menu shows two options which are described below,

Load Fail-Safe Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.13 Supervisor/User Password Setting

Either supervisor or user password can be setup, or both of then. The differences between are:

Set Supervisor Password: can enter and change the options of the setup menus.

Set User Password: just can only enter but do not have the right to change the options of the setup menus. When selecting this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will reboot and Setup can be entered freely.

PASSWORD DISABLED

When a password has been enabled, user will be prompted to enter it every time user tries to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of the computer.

User may determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.14 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after system off. During subsequent booting of computer, the BIOS configures the system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows user to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

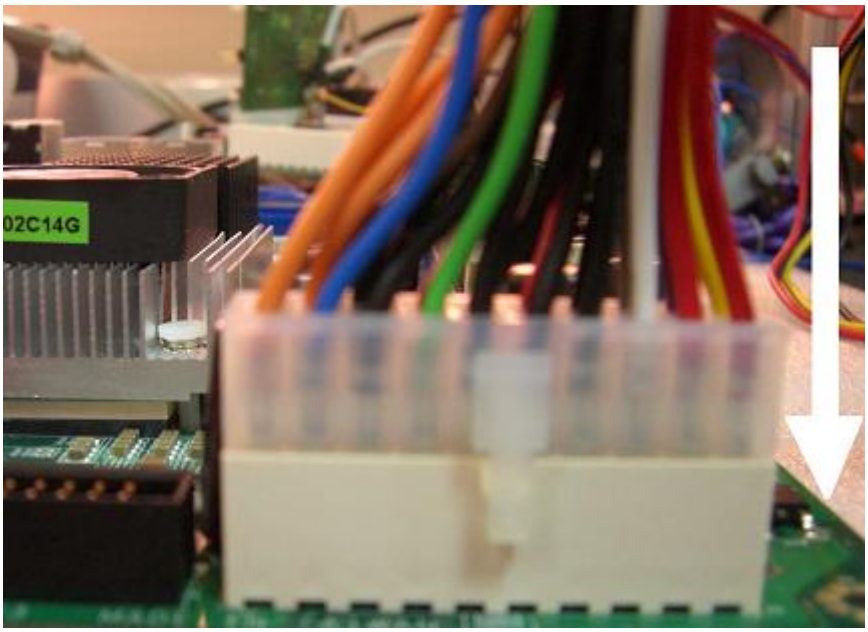
Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get RUBY-7720VG2A running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, RUBY-7720VG2A supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J31 (20 pins Power Connector) Figure.



CPU Jumper Setting

JP11 : CPU Type Setup

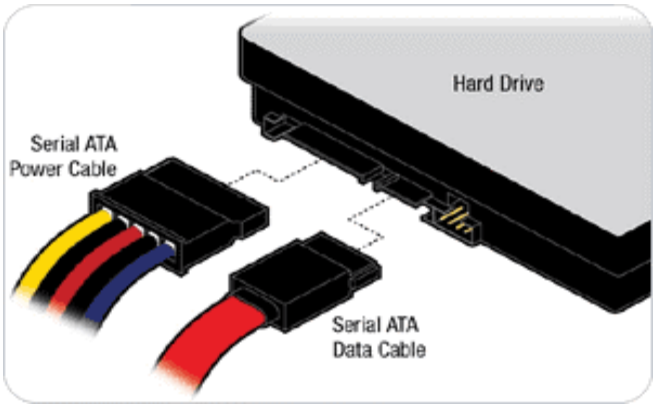
JP11	Signal Description
1-2 Short	BANIAS(1.8V)
2-3 Short	DOTHAN(1.5V)

JP10 : CPU FSB Setup

JP10	Signal Description
1-2 Short	FSB 400MHz
2-3 Short	FSB 533MHz

Serial ATA Hard Disk Setting for IDE

Each Serial ATA channel can only connect to one SATA hard disk at a time; there are total two connectors, J29/J30. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to do is to plug in two cables and enable SATA in System BIOS.



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 240-pin DDR2 SDRAM, keyboard, mouse, floppy drive, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with RUBY-7720VG2A, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2/COM3/COM4 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Counter
IRQ #1	Keyboard
IRQ #2	Programmed Controller
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Network Controller , Multimedia Device , Printer Port (Parallel Port)
IRQ #6	Floppy Disk Controller
IRQ #7	
IRQ #8	CMOS Clock
IRQ #9	Display Controller , ACPI Controller , USB 1.0/1.1 UHCI Controller
IRQ #10	Network Controller , USB 1.0/1.1 UHCI Controller, USB 2.0 EHCI Controller , COM3/4
IRQ #11	SMBus , USB 1.0/1.1 UHCI Controller ,
IRQ #12	PS/2 mouse
IRQ #13	Data Processor
IRQ #14	Primary IDE Controller
IRQ #15	

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Unboot problem

Symptom: SBC keeps beeping, and no screen has shown.
Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Symptom: There is neither no beeps nor screen output.
Solution: Indeed, you can do the stand-alone to identify the root cause by isolating the board from other possible system devices such as PCI device,backplane, and so on. If the system still cannot boot up, please fill out RMA from which is provides on Portwell website, and then send back to Portwell as a RMA. Besides, you also visit RMA site (http://www.portwell.com.tw/rma/login.asp) to check RMA report if necessary.

Information & Support

Question1: I power on the system, but the CPU speed is not correct. Why?
Answer: If you have ever loaded the BIOS optimal default, thank you for doing so. Please check CPU FSB/Voltage Reference CPU Jumper Setting(JP10/11)

Question2: What kind of CPU supports?
Answer: Intel Pentium M / Celeron M Processor for Mobile FSB 533/400 MHz series CPU.

Question3: How do I install the OS into SATA HDD when I choose the "Enhanced Mode" in the BIOS for HDD setting?

Answer: If you are going to use SATA and IDE HDD simultaneously, please follow the steps below to install OS properly.

Step1: Choose the "Enhanced Mode" in the BIOS

Step2: Connect SATA HDD only

Step3: Install OS

Step4: Connect IDE HDD

Please be noted that you cannot connect SATA and IDE HDD to install OS at the same time since the OS installation may fail.

Note:

Please visit our technical web site at

http://www.portwell.com.tw

For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they wull be very delighted to forward them to us.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F66	4.9K	Program Area
0F67-9F7F	576K	[Available]
= Conventional memory ends at 638K =		
9F80-9FFF	2K	Extended Bios Area
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CE7F	58K	Video ROM
CE80-EEFF	130K	Unused
EF00-EFFF	4K	ROM
F000-FFFF	64K	System ROM

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigne]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ